

## 455 Asphaltic Materials

### 455.1 Description

- (1) This section describes asphaltic materials including asphaltic binders, cements, cut-back asphalts, emulsified asphalts, and similar products. This section also describes applying tack coat.

### 455.2 Materials

#### 455.2.1 General

- (1) Furnish asphaltic material that meets the minimum PG binder grade the contract specifies. Furnish binder with an S designation unless the contract specifies otherwise. Ensure that the material furnished conforms to the Combined State Binder Group Method of Acceptance for Asphalt Binders available at:

<https://engineering.purdue.edu/~csbg/method.html>

#### 455.2.2 Sampling

##### 455.2.2.1 PG Asphalts

- (1) Sample according to the Combined State Binder Group Method of Acceptance for Asphalt Binders available at:

<https://engineering.purdue.edu/~csbg/method.html>

##### 455.2.2.2 MC, SC, and Emulsified Asphalts

- (1) Sample asphaltic material at the job site either before or during unloading. Obtain the engineer's approval of sampling methods and have the engineer observe the sampling. If sampling outside established job working hours, arrange for a department representative to be present.
- (2) Obtain representative samples at the frequency specified in [CMM 850](#) exhibit 1 and according to [WTM R66](#) except as follows:
  - If bleeding through a drain-cock in the transfer line, allow at least 5 minutes between samples.
  - If sampling from a valve installed in the side or end of the delivery vehicle tank, the valve must be between the quarter points of the tank's vertical diameter. Draw off and discard enough material to clear the intake line of material from previous loads before sampling.
- (3) Use only clean, dry sample containers free from cleaning oil or other contamination. Do not contaminate samples. Tightly seal, mark for identification, and submit to the engineer immediately after filling. The department's laboratory will test the material.

### 455.2.3 Testing

#### 455.2.3.1 PG Asphalts

- (1) Test according to the Combined State Binder Group Method of Acceptance for Asphalt Binders available at:

<https://engineering.purdue.edu/~csbg/method.html>

#### 455.2.3.2 MC, SC, and Emulsified Asphalts

- (1) Test MC and SC materials according to the following:

TEST	AASHTO	ASTM
Flash point, open tag	T 79	—
Flash point, Cleveland cup	T 48	<a href="#">ASTM D92</a>
Kinematic viscosity	T 201	<a href="#">ASTM D2170</a>
Distillation	T 78	<a href="#">ASTM D402</a>
Penetration	T 49	<a href="#">ASTM D5</a>
Ductility	T 51	—
Solubility in trichloroethylene	T 44	<a href="#">ASTM D2042</a>
Water	T 55	<a href="#">ASTM D95</a>

- (2) Test emulsified asphalts according to [AASHTO T59](#).

### 455.2.4 Physical Properties

#### 455.2.4.1 PG Asphalts

- (1) Furnish material conforming to the Combined State Binder Group Method of Acceptance for Asphalt Binders available at:

<https://engineering.purdue.edu/~csbg/method.html>

#### 455.2.4.2 MC and SC Asphalts

- (1) Furnish material conforming to the following:

Type MC asphalts..... [AASHTO M82](#)  
 Type SC asphalts ..... [AASHTO M141](#)

- (2) If sampling at the job site, also conform to kinematic viscosity requirements as follows:

TYPE	GRADE	VISCOSITY (in centistokes at 60 C)	
		MINIMUM	MAXIMUM
MC	30	25	70
MC and SC	70	60	160
MC and SC	250	230	540
MC and SC	800	700	1800
MC and SC	3000	2600	7000

#### 455.2.4.3 Emulsified Asphalts

**455.2.4.3 Add via ASP-6 for Nov. 2022 LET. Add information for non-tracking emulsified asphalt.**

- (1) Furnish material conforming, before dilution, to the following:

Anionic emulsified asphalts <sup>[1]</sup>..... [AASHTO M140](#)  
 Cationic emulsified asphalts <sup>[1]</sup>..... [AASHTO M208](#)  
 Polymer-modified cationic emulsified asphalts ..... [AASHTO M316](#)

<sup>[1]</sup> Non-tracking emulsified asphalts shall conform to TABLE 455-1 for the type and grade specified.

**TABLE 455-1 Requirements for Non-Tracking Emulsified Asphalt**

PRODUCT	ANTT	CNTT
Saybolt Viscosity at 77°F (25°C), ( <a href="#">AASHTO T59</a> ), SFS	15-100	15-100
Paddle Viscosity at 77°F (25°C), ( <a href="#">AASHTO T382</a> ), cPs <sup>[1]</sup>	30-200	30-200
Storage Stability Test, 24 hr, ( <a href="#">AASHTO T59</a> ), %	1 max	1 max
Residue by Distillation, 500 ± 10 °F (260 ± 5 °C), or Residue by Evaporation, 325 ± 5 °F (163 ± 3 °C), ( <a href="#">AASHTO T59</a> ), %	50 min	50 min
Sieve Test, No. 20 (850 µm), ( <a href="#">AASHTO T59</a> ), %	0.3	0.3
Penetration at 77°F (25°C), 100 g, 5 sec, ( <a href="#">AASHTO T49</a> ), dmm	10-40	10-40
Ash Content, ( <a href="#">AASHTO T111</a> ), %	1 max	1 max
Solubility in Trichloroethylene Test, ( <a href="#">AASHTO T44</a> ) <sup>[2]</sup>	97.5% min	97.5% min

<sup>[1]</sup> Paddle Viscosity ([AASHTO T 382](#)) may be run in lieu of Saybolt Viscosity ([AASHTO T59](#)).

<sup>[2]</sup> The solubility in Trichloroethylene test ([AASHTO T 44](#)) may be run in lieu of Ash Content ([AASHTO T111](#)).

- (2) Ensure that the bill of lading for emulsified asphalts indicates the asphalt content of the original emulsion and dilution rate of the additional water added to the original emulsion. If undiluted samples are not available, test the diluted material and modify [AASHTO M140](#), [M208](#), or [M316](#) to reflect properties resulting from dilution of the asphalt.

#### 455.2.5 Tack Coat

- (1) Under the Tack Coat bid item, furnish type SS-1h, CSS-1h, QS-1h, CQS-1h, **ANTT**, **CNTT**, or modified emulsified asphalt with an “h” suffix, unless the contract specifies otherwise.

#### 455.3 Construction

##### 455.3.1 General

- (1) Heat asphaltic materials so that the temperature when entering the mixer or at application is within the limits the supplier specifies.

##### 455.3.2 Tack Coat

###### 455.3.2.1 General

- (1) Apply tack coat only when the air temperature is 32 F or more unless the engineer approves otherwise in writing. Before applying tack coat ensure that the surface is reasonably free of loose dirt, dust, or other foreign matter. Do not apply to surfaces with standing water. Do not apply if weather or surface conditions are unfavorable or before impending rains.

- (2) Use tack material of the type and grade the contract specifies. The contractor may, with the engineer's approval, dilute tack material as allowed under [455.2.4](#). Provide calculations using the asphalt content as-received from the supplier and subsequent contractor dilutions to show that as-placed material has 50 percent or more residual asphalt content. Apply at 0.050 to 0.070 gallons per square yard, after dilution, unless the contract designates otherwise. The engineer may adjust the application rate based on surface conditions. Limit application each day to the area the contractor expects to pave during that day.
- (3) Keep the road open to all traffic during the work unless the contract specifies otherwise. Plan and prosecute tacking operations to adequately provide for traffic without damaging the work. If tacking a lane closed to traffic, pave within 72 hours after tacking.

#### **455.3.2.2 Equipment**

##### **455.3.2.2.1 General**

- (1) Have necessary equipment available on the job before beginning tack coat operations.

##### **455.3.2.2.2 Tank Car Heating Equipment**

- (1) Heat the tack material by circulating steam through the coils of the tank or use another engineer-approved system. Use equipment designed to heat without burning or overheating any portion of the material. Provide effective and positive control of the heat at all times.
- (2) The department will reject tack material from tank cars without heating coils, or with defective heating coils, unless the contractor uses engineer-approved alternate methods to heat the material without introducing moisture. Do not agitate or heat the tack coat material by directly introducing live steam.

##### **455.3.2.2.3 Tack Distributors**

- (1) Provide a tachometer, pressure gauges, and accurate volume measuring devices or a calibrated tank. Also provide a thermometer for measuring the temperature of the tank contents.
- (2) Equip distributors with a pump power unit and full circulation spray bars adjustable laterally and vertically. Provide a heating system that circulates material through the spray bar during the entire heating process. Also provide a hose and spray nozzle to apply tack to areas inaccessible to the spray bar.

##### **455.3.2.3 Preparing the Existing Surface**

- (1) Prepare the base or existing surface as specified for preparing the foundation for asphalt surfacing in [211](#). Immediately before applying tack material, sweep existing surfaces to remove dust, dirt, or other objectionable material.

##### **455.3.2.4 Heating and Applying Asphaltic Materials**

- (1) The department will reject overheated or otherwise damaged tack material.
- (2) Place tack in a single application unless the contract or engineer specifies otherwise. Determine the appropriate width for the application based on traffic handling and sequencing of subsequent surface course construction. Distribute uniformly over the surface to be treated.
- (3) Determine an application rate for the surface condition required to effectively bond the overlying material. Obtain the engineer's approval for the application rate. Correct for under application by applying additional material. If the contractor cannot maintain the application rate within tolerances, discontinue operations and make the necessary corrections to personnel or equipment required to remedy the problem.
- (4) Turn outside edges nozzles to spray parallel to the road centerline. Do not operate with any clogged nozzles.
- (5) Protect structures, as the engineer approves, to prevent spatter or marring by tacking operations. Include surfaces of railings, curbs, gutters, and other appurtenances of existing structures. Also protect adjacent concrete pavement that will not be resurfaced with asphaltic pavement or surfacing.

##### **455.3.2.5 Maintaining Tack Coat**

- (1) Protect and repair the existing surface and the tack coat. Correct areas with excess or deficient tack material and any breaks, raveled spots, or other areas where bond might be affected. Keep tack free of contaminants which may affect bond.
- (2) Remove tack coat tracked by construction traffic immediately.

##### **455.3.2.6 Nonconforming Tack Coat**

- (1) Tack coat is nonconforming as follows:
  - Where applied tack coat is tracked either offsite or to other areas of the construction site.
  - Where excess tack coat accumulates in puddles.

- In areas with insufficient residual asphalt content.

- (2) Remove tracked tack and correct nonconforming tack coat.

#### **455.4 Measurement**

##### **455.4.1 General**

- (1) The department will measure the Asphaltic Material Seal Coat and Tack Coat bid items by the ton or gallon acceptably completed, based on either shipment net weight, or corrected volume. The department will not measure nonconforming materials unless the engineer allows those materials to remain in place. The department will deduct for material wasted or not actually incorporated in the work.

##### **455.4.2 Corrected Volume**

- (1) The department will measure asphaltic material for seal coats, tack coats, and similar products in calibrated tank cars, tank trucks, or storage tanks. Calibrate storage tanks and provide the engineer with charts indicating the depth versus liquid volume relationship.
- (2) The department will correct the measured volume to a temperature of 60 F for PG, MC, and SC asphalts as follows:
- If the specific gravity at 60 F is greater than 0.966:

$$V = V1(1.021 - 0.00035T)$$

- If the specific gravity at 60 F is from 0.850 to 0.966 inclusive:

$$V = V1(1.0246 - 0.00041T)$$

**Where:**

**V** = Volume in gallons at 60 F.

**V1** = Volume in gallons at observed temperature, F.

**T** = Observed temperature, F.

- (3) Calculate the volume correction for emulsified asphalts as follows:

$$V = V1 / (0.985 + 0.00025T)$$

**Where:**

**V** = Volume in gallons at 60 F.

**V1** = Volume in gallons at observed temperature, F.

**T** = Observed temperature, F.

#### **455.5 Payment**

##### **455.5.1 General**

- (1) The department will pay for measured quantities at the contract unit price under the following bid items:

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
455.0500	Asphaltic Material Seal Coat	TON
455.0505	Asphaltic Material Seal Coat	GAL
455.0600	Tack Coat	TON
455.0605	Tack Coat	GAL

##### **455.5.2 Asphaltic Material Seal Coat**

- (1) Payment for Asphaltic Material Seal Coat is full compensation for furnishing asphaltic material used in seal coats provided under [475](#). The department will pay for nonconforming seal coat material the engineer allows to remain in place at 75 percent of the contract unit price.

##### **455.5.3 Tack Coat**

- (1) Payment for Tack Coat is full compensation for providing tack coat; for preparing the surface; and for maintaining the completed work.
- (2) The department will adjust pay for Tack Coat, under the Nonconforming Tack Coat administrative item, for nonconforming material the engineer allows to remain in place at a maximum of 75 percent of the contract unit price.