

9-02 BITUMINOUS MATERIALS**9-02.1 Asphalt Material, General**

Asphalt furnished under these Specifications shall not have been distilled at a temperature high enough to injure by burning or to produce flecks of carbonaceous matter, and upon arrival at the Work, shall show no signs of separation into lighter and heavier components.

9-02.1(1) Vacant**9-02.1(2) Vacant****9-02.1(3) Vacant****9-02.1(4) Performance Graded Asphalt Binder (PGAB)**

PGAB meeting the requirements of AASHTO M 320 Table 1 of the grades specified in the Contract shall be used in the production of HMA. The Direct Tension Test (AASHTO T 314) of M 320 is not a Specification requirement.

9-02.1(4)A Quality Control Plan

The Asphalt Supplier of PGAB shall have a Quality Control Plan (QCP) in accordance with WSDOT QC 2 “Standard Practice for Asphalt Suppliers That Certify Performance Graded Asphalts”. The Asphalt Supplier’s QCP shall be submitted and approved by the WSDOT State Materials Laboratory. Any change to the QCP will require a new QCP to be submitted. The Asphalt Supplier of PGAB shall certify through the Bill of Lading that PGAB meets the Specification requirements of the Contract.

Table 9-02.1(6) - Cationic Emulsified Asphalt

Grade	Type AASHTO Test Method	Rapid Setting				Medium Setting				Slow Setting				Special Tack				
		CRS-1		CRS-2		CMS-2S		CMS-2		CMS-2h		CSS-1		CSS-1h		STE-1		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Emulsions:																		
Viscosity Saybolt Furol S @ 77°F (25 °C)	T 59	—	—	—	—	—	—	—	—	—	—	—	20	100	20	100	—	30
Viscosity Saybolt Furol S @ 122°F (50 °C)	T 59	20	100	150	400	50	450	50	450	50	450	—	—	—	—	—	—	
Storage stability test 1 day %	T 59	—	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1	
Demulsibility 35 ml 0.8% sodium dioctyl sulfosuccinate, % ^a	T 59	40	—	40	—	—	—	—	—	—	—	—	—	—	—	—	25	—
Coating ability & water resistance:																		
Coating, dry aggregate	T 59	—	—	—	—	Good	—	Good	—	Good	—	—	—	—	—	—	—	—
Coating, after spraying	T 59	—	—	—	—	Fair	—	Fair	—	Fair	—	—	—	—	—	—	—	—
Coating, wet aggregate	T 59	—	—	—	—	Fair	—	Fair	—	Fair	—	—	—	—	—	—	—	—
Coating, after spraying	T 59	—	—	—	—	Fair	—	Fair	—	Fair	—	—	—	—	—	—	—	—

Table 9-02.1(6) - Cationic Emulsified Asphalt (Continued)

Grade	Type AASHTO Test Method	Rapid Setting				Medium Setting						Slow Setting				Special Tack	
		CRS-1		CRS-2		CMS-2S		CMS-2		CMS-2h		CSS-1		CSS-1h		STE-1	
		Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max
Particle charge test	T 59	Pos		Pos		Pos		Pos		Pos		Pos ^b		Pos ^b		Pos	
Sieve Test, %	T 59	—	0.10	—	0.10	—	0.10	—	0.10	—	0.10	—	0.10	—	0.10	—	0.10
Cement mixing test, %	T 59	—	—	—	—	—	—	—	—	—	—	—	2.0	—	2.0	—	—
Distillation:																	
Oil distillate by vol. of emulsions %	T 59	—	3	1.5	3	—	20	—	12	—	12	—	—	—	—	—	5
Residue, %	T 59	60	—	65	—	60	—	65	—	65	—	57	—	57	—	45	—
Tests on residue from distillation tests:																	
Penetration, 77°F (25° C)	T 49	100	250	100	250	100	250	100	250	40	90	100	250	40	90	100	200
Ductility, 77°F (25° C) 5 cm/min., cm	T 51	40	—	40	—	40	—	40	—	40	—	40	—	40	—	40	—
Solubility in trichloroethylene, %	T 44	97.5	—	97.5	—	97.5	—	97.5	—	97.5	—	97.5	—	97.5	—	97.5	—

^aThe demulsibility test shall be made within 30 days from date of shipment.

^bIf the particle charge test for CSS-1 and CSS-1h is inconclusive, material having a maximum pH value of 6.7 will be acceptable.

9-02.1(5) Vacant**9-02.1(6) Cationic Emulsified Asphalt**

See table 9-02.1(6)

9-02.1(6)A Polymerized Cationic Emulsified Asphalt CRS-2P

The asphalt CRS-2P shall be a polymerized cationic emulsified asphalt. The polymer shall be milled into the asphalt or emulsion during the manufacturing of the emulsion. The asphalt CRS-2P shall meet the following Specifications:

	AASHTO Test Method	Specifications	
		Minimum	Maximum
Viscosity @122°F, SFS	T 59	100	400
Storage Stability 1 day %	T 59	---	1
Demulsibility 35 ml. 0.8% Dioctyl Sodium Sulfosuccinate	T 59	40	---
Particle Charge	T 59	positive	---
Sieve Test %	T 59	---	0.30
Distillation			
Oil distillate by vol. of emulsion %	T 59 ^{note 1}	0	3
Residue	T 59 ^{note 1}	65	---
Test on the Residue From Distillation			
Penetration @77°F	T 49	100	250
Torsional Recovery %	^{note 2}	18	---
or			
Toughness/Tenacity in-lbs	^{note 3}	50/25	---

^{note 1} Distillation modified to use 300 grams of emulsion heated to 350°F ± 9°F and maintained for 20 minutes.

^{note 2} The Torsional Recovery test shall be conducted according to the California Department of Transportation Test Method No. 332. The residue material for this test shall come from California Department of Transportation Test Method No. 331.

^{note 3} Benson method of toughness and tenacity; Scott tester, inch-pounds at 77°F, 20 in. per minute pull. Tension head 7/8 in. diameter.

At the option of the supplier the Benson Toughness/Tenacity test can be used in lieu of Torsional Recovery based on type of modifier used. If the Benson Toughness/Tenacity method is used for acceptance the supplier must supply all test data verifying Specification conformance.

9-02.1(7) Asphalt for Sub-Sealing

Asphalt for sub-sealing shall conform to the requirements of ASTM D 3141 except that the minimum softening point shall be 170°F.

9-02.1(8) Flexible Bituminous Pavement Marker Adhesive

Flexible bituminous pavement marker adhesive is a hot melt thermoplastic bituminous material used for bonding raised pavement markers and recessed pavement markers to the pavement.

The adhesive material shall conform to the following requirements:

Property	Test Method	Requirement
Penetration, 77°F, 100g, 5 sec, dmm	AASHTO T 49	30 Max.
Softening Point, F	AASHTO T 53	200 Min.
Rotational Thermosel Viscosity, cP, #27 spindle, 20 RPM, 400°F	AASHTO T 316	5000 Max.
Ductility, 77°F, 5 cm/minute, cm	AASHTO T 51	15 Min.
Ductility, 39.2°F, 1 cm/minute, cm	ASTM D 51	5 Min.
Flexibility, 1", 20°F, 90 deg. Bend, 10 sec., 1/8" x 1" x 6" specimen	ASTM D 3111 NOTE 1	Pass

Flexible bituminous adhesive shall develop bond pull-off strength greater than 50 psi when tested in accordance with WSDOT T-426.

Note 1: Flexibility test is modified by bending specimen through an arc of 90 degrees at a uniform rate in 10 seconds over a 1-inch diameter mandrel.

9-02.1(9) Coal Tar Pitch Emulsion, Cationic Asphalt Emulsion Blend Sealer

Bituminous asphalt seal coat material shall be a blend of 20 percent Coal Tar Pitch Emulsion, and 80 percent Cationic Asphalt Emulsion, together with specified additives, minerals and sand aggregate.

The Coal Tar Pitch Emulsion component shall conform to all requirements of Federal Specification RP-355E. The emulsion shall be prepared from straight run, high temperature, coke oven tar meeting the requirements of Federal Specification RC 1424.

The Cationic Emulsified Asphalt component shall be CSS-1h grade emulsion, meeting the requirements of Section 9-02.1(6), Cationic Emulsified Asphalt.

The blended emulsion shall be homogeneous and shall show no separation or coagulation of components that cannot be overcome by moderate stirring. It shall be capable of being applied completely by squeegee, brush, or other approved mechanical methods to the surface of bituminous pavements when spread at the specified rates.

9-02.2 Sampling and Acceptance

9-02.2(1) Certification of Shipment

Bituminous materials may be accepted by the Engineer based on the asphalt binder supplier’s Certification of Compliance incorporated in their Bill of Lading. The Certification will include a statement certifying Specification compliance for the product shipped. Failure to provide this Certification with the shipment shall be cause for rejection of the material. The following information is required on the Bill of Lading:

1. Date
2. Contract Number and/or Project Name
3. Grade of Commodity and Certification of Compliance
4. Anti-strip Type
5. Percent Anti-strip

6. Mass (Net Tons)
7. Volume (Gross Gallons)
8. Temperature of Load (F)
9. Bill of Lading Number
10. Consignee and Delivery Point
11. Signature of Supplier's Representative
12. Supplier (Bill of Lading Generator)
13. Supplier's Address
14. Refiner
15. Refiner's Location

The Bill of Lading shall be supplied at the time of shipment of each truck load, truck and trailer, or other lot of asphalt binder. In addition to the copies the Contractor requires, one copy of the Bill of Lading including the Certification Statement shall be sent with the shipment for agency use.

9-02.2(2) Samples

When requested by the Engineer, the asphalt supplier shall ship, by prepaid express or U.S. mail, samples of asphalt that represent current production.

9-02.3 Temperature of Asphalt

The temperature of paving asphalts in storage tanks when loaded for transporting shall not exceed the maximum temperature recommended by the asphalt binder manufacturer.

9-02.4 Anti-Stripping Additive

When directed by the Engineer, heat-stable anti-stripping additive shall be added to the asphalt mix. At the option of the Contractor, the anti-stripping additive can be either added to the liquid asphalt or sprayed on the aggregate on the cold feed. Once the process and type of anti-stripping additive proposed by the Contractor have been approved by the State Materials Laboratory, the process, brand, grade, and amount of anti-stripping additive shall not be changed without approval of the Engineer.

When liquid anti-stripping additive is added to the liquid asphalt, the amount will be designated by the Engineer, but shall not exceed 1 percent by weight of the liquid asphalt.

When polymer additives are sprayed on the aggregate, the amount will be designated by the Engineer, but shall not exceed 0.67 percent by weight of the aggregate.

The use of another process or procedure for adding anti-stripping additive to the asphalt mix will be considered based on a proposal from the Contractor.