

**Replace Section 37-2.07 of the RSS with:**

**37-2.07 Rejuvenating Scrub Seal**

**37-2.07A General**

**37-2.07A(1) Summary**

Section 37-2.07 includes specifications for applying rejuvenating scrub seal. Rejuvenating scrub seal includes:

1. Applying a polymer modified rejuvenating asphaltic emulsion and scrubbing the emulsion with a scrub broom to fill cracks and voids in the pavement,
2. Applying aggregate
3. Applying a flush coat.

Flush coat must comply with section 37-4.03 of the Revised Standard Specifications.

**37-2.07A(2) Definitions**

Reserved

**37-2.07A(3) Submittals**

At least 15 days before starting seal placement, submit:

1. SDS for each polymer modified rejuvenating asphaltic emulsion ingredient and the polymer modified rejuvenating asphaltic emulsion as an informational submittal.
2. Two 1-quart wide mouth plastic containers with screw top lids of polymer modified rejuvenating asphaltic emulsion.
3. Polymer modified rejuvenating asphaltic emulsion test results for quality characteristics specified in 37-2.07B(2) from supplier of polymer modified rejuvenating asphaltic emulsion as an informational submittal.
4. Rejuvenating agent test results for quality characteristics specified in 37-2.07B(2) from the supplier of the polymer modified rejuvenating asphaltic emulsion as an informational submittal.

For each delivery of polymer modified rejuvenating asphaltic emulsion to the job site, submit a certificate of compliance and a copy of the specified test results from the emulsion supplier.

Submit quality control samples of polymer modified rejuvenating asphaltic emulsion to the authorized laboratory and the Engineer. Each 1-quart sample must be in a wide mouth plastic container and submitted in an insulated shipping container.

Within 3 business days after taking polymer modified rejuvenating asphaltic emulsion quality control samples, submit the authorized laboratory's test results.

Within 7 days after field sampling aggregate and polymer modified rejuvenating asphaltic emulsion submit Vialit quality control test results.

**37-2.07A(4) Quality Assurance**

**37-2.07A(4)(a) General**

For polymer modified rejuvenating asphaltic emulsion quality control testing the authorized laboratory must participate in the AASHTO re:source proficiency samples program.

**37-2.07A(4)(b) Quality Control**

**37-2.07A(4)(b)(i) Polymer Modified Rejuvenating Asphaltic Emulsion**

Circulate polymer modified rejuvenation asphaltic emulsion in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw

and dispose of 1 gallon. In the presence of the engineer, take two 1-quart samples in a wide mouth plastic containers with lined sealed lid for acceptance testing.

For polymer modified rejuvenating asphaltic emulsion, perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

**Polymer Modified Rejuvenating Asphaltic Emulsion**

Quality characteristic	Test method	Minimum sampling and testing frequency	Sampling location	
Saybolt Furol Viscosity, at 50° C (Saybolt Furol seconds)	AASHTO T 59	Minimum 1 per day per delivery truck	Distributor truck	
Residue (min, %)				
Storage stability test, 1 day (max, %)				
pH				ASTM E70
Sieve test (max, %)				ASTM D244
Oil distillate, (max, %)	ASTM D244			
Test on Residue Recovered by Evaporation (AASHTO T59)				
Viscosity @ 60°C, (P), (max)	ASTM D2171	Minimum 1 per day per delivery truck	Distributor truck	
Penetration, 4°C (min)	ASTM D5			
MSCR <sup>1</sup>	AASHTO TP 70 MP 19, PG 64-22			
Elastic Recovery <sup>2</sup> (min, %)	ASTM T301			

<sup>1</sup> Report only. Report "S", "H", "V", or "E" grade based on PG 64-22. Report once per project.

<sup>2</sup>Elastic Recovery @ 10° C (50° F): Hour glass sides, pull to 20 cm, hold 5 minutes then cut, let sit 1 hour.

**37-2.07A(4)(b)(ii) Rejuvenating Scrub Seal**

For rejuvenating scrub seal, perform sampling and testing at the specified frequency and location for the following quality characteristics:

**Rejuvenating Scrub Seal Quality Control Requirements**

Quality characteristic	Test method	Minimum sampling and testing frequency	Location of sampling
Polymer modified rejuvenating Asphaltic emulsion binder spread rate (gal/sq yd)	California Test 339	1 per day per distributor truck	Pavement surface
Chip retention (%)	Vialit test method for aggregate in chip seals, French chip	1st day of production	Screenings haul Truck

**37-2.07A(4)(c) Department Acceptance**

Polymer modified rejuvenating asphaltic emulsion acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics shown in table titled "Polymer Modified Rejuvenating Asphaltic Emulsion" in section 37-2.07B(2).

Aggregate gradation acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

### Aggregate Gradation Acceptance Criteria

Quality characteristic	Test method	Requirement		
Gradation (% passing by weight)	California Test 202	3/8"	5/16"	1/4"
Sieve size:				
3/4"		--	--	--
1/2"		100	--	--
3/8"		85–100	100	100
No. 4		0–15	0–50	60–85
No. 8		0–5	0–15	0–25
No. 16		--	0–5	0–5
No. 30		--	0–3	0–3
No. 200	0–2	0–2	0–2	

#### 37-2.07B Materials

##### 37-2.07B(1) General

Not Used

##### 37-2.07B(2) Polymer Modified Rejuvenating Asphaltic Emulsion

Polymer modified rejuvenating asphaltic emulsion is made with polymer, rejuvenating agent and asphalt and must meet the requirements for the quality characteristics shown in the following table:

#### Polymer Modified Rejuvenating Asphaltic Emulsion

Quality characteristic	Test method	Requirements
Tests on Emulsion		
Viscosity @50° C (Saybolt Furol seconds)	AASHTO T59	50 - 350
Residue (min, %)	AASHTO T59	65
pH	ASTM E70	2.0-5.0
Sieve (max, %)	ASTM D244	0.1
Oil distillate (max, %)	ASTM D244	0.5
Storage Stability, 24 Hr 25°C (max, %)	AASHTO T59	1.0
Test on Residue Recovered by Evaporation (AASHTO T59)		
Viscosity @ 60°C, (P) (max)	ASTM D2171 <sup>1,2</sup>	5000
Penetration @ 4°C, (min)	ASTM D5	40-70
MSCR	AASHTO TP 70 MP 19, PG 64-22	Report Only <sup>3</sup>
Elastic Recovery (min, %)	ASTM T301 <sup>4</sup>	60

<sup>1</sup>If it is suspected that a sample may contain solid material, strain the melted sample into the container through a No. 50 (300-µm) sieve conforming to Specification E 11.

<sup>2</sup>Use an AI- 200 glass capillary tube to run the test. If the viscosity is 4000 or above use an AI 400 instead.

<sup>3</sup>Report only. Report "S", "H", "V", or "E" grade based on PG 64-22. Report once per project.

<sup>4</sup>Elastic Recovery @ 10° C (50° F): Hour glass sides, pull to 20 cm, hold 5 minutes then cut, let sit 1 hour.

Rejuvenating agent must meet the requirements for the quality characteristics shown in the following table:

#### Rejuvenating Agent

Quality characteristic	Test method	Requirements
Test on rejuvenating agent		
Viscosity, 60 °C, cSt (centistoke)	ASTM D2170	50-175
Flash point, °C, (min)	ASTM D92	193

Saturate, (max, % by weight)	ASTM D2007	30
Asphaltenes, (max)	ASTM D2007	1.0
Test on rejuvenating agent RTFOT Residue		
Weight change (max, %)	ASTM D2872	6.5
Viscosity ratio (max)	ASTM D2170	3

### 37-2.07B(3) Aggregate

Aggregate for scrub seal must comply with the \_\_\_\_\_ gradation.

Aggregate gradation for scrub seal must comply with the requirements shown in the following table:

**Aggregate Gradation**

Quality characteristic	Test method	Requirement		
		3/8"	5/16"	1/4"
Gradation (% passing by weight)	California Test 202	3/8"	5/16"	1/4"
Sieve size:				
3/4"		--	--	--
1/2"		100	--	--
3/8"		85-100	100	100
No. 4		0-15	0-50	60-85
No. 8		0-5	0-15	0-25
No. 16		--	0-5	0-5
No. 30		--	0-3	0-3
No. 200		0-2	0-2	0-2

### 37-2.07C Construction

#### 37-2.07C(1) General

Rejuvenating scrub seal construction must comply with Section 37-2.03C and the following requirements.

#### 37-2.07C(2) Equipment

The emulsion scrub broom must be:

1. Constructed of metal and meet the following dimensions or requirements:
  - 1.1. Have a main rigid body frame with a minimum of 6 feet 9 inches wide and 8 feet deep and a maximum of 8 feet wide and 10 feet deep, and:
    - 1.1.1. The nearest and furthest members, paralleling the back of the spreader truck, and diagonal members must be equipped with street broom.
    - 1.1.2. The leading member and the trailing member must have broom heads angled at 10-15 degrees off the centerline of the supporting member.
    - 1.1.3. The diagonal member must have broom heads attached in line with the centerline of the supporting member.
  - 1.2. Each individual street broom attached to the scrub broom assembly must be:
    - 1.2.2. 3 1/2" wide x 6 1/2" high x 16" long
      - 1.2.1. Have stiff nylon bristles that are maintained at a minimum height of 5 inches.
  - 1.3. Be equipped with a minimum of 2- hinged wing assemblies attached to the main body not to exceed 5 feet in total per side, with diagonals and equipped with street brooms.
2. Attached to and pulled by the distributor truck.
3. Equipped with the means to mechanically raise and lower the broom off and onto the road surface at designated points of completion and start up.
4. Towable in the elevated position to the next area of construction.
5. Weighted correctly such that it does not squeegee the emulsion sealer off the roadway surface.

#### 37-2.07C(3) Applying Emulsion

Polymer modified rejuvenating asphaltic emulsion must be applied within the application rate ranges shown in the following table:

**Polymer Modified Rejuvenation Asphaltic Emulsion  
Application Rates**

Chip seal gradation	Application rate range (gal/sq yd)
3/8"	0.30–0.45
5/16"	0.25–0.35
1/4"	0.20–0.30

Apply polymer modified rejuvenating asphaltic emulsion and immediately broom the emulsion to fill cracks and voids with the emulsion scrub broom. Maintain a neat and uniform line at the edge of the limits of the scrub seal application.

**37-2.07C(4) Spreading Aggregate**

Aggregate must be spread within the spread rate ranges shown in the following table:

<b>Aggregate Spread Rates</b>	
Grade	Spread rate range (lb/sq yd)
3/8"	20–30
5/16"	16–25
1/4"	12–20

**37-2.07C(5) Flush Coat**

Apply flush coat before opening to traffic.

**37-2.07D Payment**

Not Used