

PRESERVATIVE SEAL ~~and SEALCOATING~~ FOR ASPHALT CONCRETE**718.1 GENERAL**

Asphalt Concrete preservative seal shall be one of the following types or equal, with typical application rates. Sealcoating material shall meet the requirements of section 718.3

TYPE A - Asphalt rejuvenating agent shall be an emulsion composed of a petroleum resin oil base uniformly emulsified with water. Each supplier must submit a certified statement from the asphalt rejuvenator manufacturer showing that the asphalt rejuvenating emulsion conforms to the required physical and chemical requirements. They also must provide documentation of tests that determine the acceptable range of application of the product. Typical application rates are 0.07 to 0.18 gallons per square yard.

TYPE B - Petroleum Hydrocarbon emulsion. Applied at 0.05 to 0.20 gallons per square yard, diluted.

TYPE C - Tire modified surface sealer (TRMSS) or equal not diluted, and applied at a rate of 0.10 to 0.20 gallons per square yard.

TYPE D - Acrylic polymer modified emulsion Diluted to the manufacture's recommendation and applied at a rate of 0.08 to 0.20 gallons per square yard.

TYPE E - Polymer modified rejuvenating emulsion. (PMRE) Diluted to the manufacture's recommendation and applied at a rate of 0.08 to 0.20 gallons per square yard.

718.2 TEST METHODS AND REQUIREMENTS PRESERVATIVE SEAL

Preservative seal for asphalt concrete material, shall meet type A, B, C, D or E on Table [718-1](#) by certification from the manufacturer.

Tests shall be performed by AMRL accredited laboratory, accredited in the specified test being performed. A full set of tests shall be performed by as specified by the special provisions in the undiluted condition. These tests and any other specified will be performed at the contractor's expense. Only residue by evaporation shall be run on diluted samples.

TABLE 718-1						
PRESERVATIVE SEAL SPECIFICATIONS						
Properties	Method	Type-A	Type-B	Type-C	Type-D	Type-E
Saybolt Viscosity @77°F (sfs)	ASTM D244	15-40	25-150	200-2000 Cp (Note 1)	15-40	50-150
Sieve test %	ASTM D244	0.1 max				
Storage Stability, 24 hours, %	ASTM D244					1.0 max
Settlement test, 5 days, %	ASTM D244		2.0 max		5.0 max	
Test on residue by:		ASTM D244 Evaporation To 138°C	ASTM D244 Distillation To 177°C			
Residue Content, %	ASTM D244	60 min	62 min	30 min	53 min	65 min
Oil Distillate, % by volume	ASTM D244					0.5 max
Flash point (Note 2) °F	ASTM D92	400°F	450°F	450°F	450°F	
Softening point, °F	ASTM D5			140 min.	130 min	
Viscosity (Note 3), 60C, Poise	ASTM D2171					5000 max

Properties	Method	Type-A	Type-B	Type-C	Type-D	Type-E
Elastic Recovery ^(Note 4) , 10C, %	AASHTO T301					50 min
Test on residue by:		ASTM D244 Evaporation To 138°C	ASTM D244 Evaporation To 138°C	ASTM D244 Evaporation To 138°C	ASTM D244 Evaporation To 138°C	ASTM D244 Distillation To 177°C
Ductility, 25C, 5 cm/min, cm	ASTM D113				20 min	
Penetration, 25C, 100g/5 sec, dmm	ASTM D5				20-80	
Penetration, 4C, 200g/60 sec, dmm	ASTM D5					20-70
Kinematic Viscosity, 140°F, cSt	ASTM D2170	100-200	1,000-9,500			
Accelerated Weathering test ^(Note 5)	ASTM D4799				Plant certification within 12 months	
Test on		Evaporative Residue	Evaporative Residue			Rejuvenating Agent Base
Asphaltenes, % w	ASTM D2006	1.0 max	10.0 Max.			1.0 max
Maltene Dist. Ratio (PC+A ₁)/(A ₂ +S)	ASTM D2006	0.3-0.6	0.2-1.4			
PC/S Ratio ⁴⁵ ^(Note-4)	ASTM D2006	0.5 min	0.5 min.			
Saturated Hydrocarbons, S ^{5(note-4)}	ASTM D2006	28 max	28 max.			30 max
Kinematic Viscosity, 140°F, cSt	ASTM D2170					50-175
Flash point °F	ASTM D92					375 min
Test on residue from RTFO:	ASTM D2872					Rejuvenating Agent Base
Mass Change, %	ASTM D2872					6.5 max
Kinematic Viscosity, 140°F, cSt	ASTM D2170					Report
Kinematic Viscosity, Ratio ^(Note 6)						3.0 max

Notes:

1. Brookfield viscosity using spindle #27 (ASTM D4402) test temperature at 140°F. ~~Temperature equilibrate the sample for a minimum of 20 minutes. Sample test run time is at a minimum of 5 minutes. Sample needs to be inside the Brookfield viscosity tube, for 5 minutes minimum.~~
2. Flash point on residue may be waived by the engineer during production sampling and testing provided manufacturer submits results performed in the previous 12 months in compliance.
3. Viscosity in poise may be determined using AASHTO T315 by converting the Complex Dynamic Shear Viscosity to Viscosity in poise.
4. Elastic Recovery molds shall have straight sides as shown in Fig. 1 of AASHTO T301
5. Other Accelerated Weathering test procedures may be presented for acceptance by the engineer prior to project start. These results shall be provided at no additional cost to the agency.
6. Kinematic Viscosity Ratio will be determined by dividing the viscosity of the material after RTFO aging by the original viscosity.

~~A full set of tests shall be performed by as specified by the special provisions in the undiluted condition. These tests and any other specified will be performed at the contractor's expense.~~

~~Only residue by evaporation shall be run on diluted samples. Specification limits should be diluted rate times~~

~~minimum residual value of concentrate.~~

~~718.3 TEST METHODS AND REQUIREMENTS SEALCOATING~~

~~Sealcoating material for asphalt concrete pavement, shall be a concentrate product "ready to use" from the manufacturer. No product dilution will be allowed at the project site during application. Sealcoating shall consist of two applications across full width of pavement surface. Edge application treatment shall also be two separate coats. Each applied coat shall be at the following minimum application rates. First coat shall be applied at a minimum application rate of 0.15 gallons per square yard, followed by a second coat applied at a minimum rate of 0.15 gallons per square yard. Application rate for each coat, above the minimum, shall be adjusted to meet the pavement surface conditions.~~

~~Material, applied as Sealcoating, shall meet the requirements on table 718-2 by certification from the manufacturer.~~

~~Tests shall be performed by AMRL-accredited laboratory.~~

TABLE 718-2		
SEALCOATING SPECIFICATIONS		
Properties * (note 2)	Method	Specification
Weight per Gallon, 25C, lbs/gal	ASTM D2939.07	10.0 min
Residue Content by Evaporation, %	ASTM D2939.08	50 min
Asphalt Content by Weight, %	ASTM D2939.21	17 min
Wet Track Abrasion Test ^(Note 1) , 1 hour, grams/sq. ft.	ASTM D3910	15 max
Wet Track Abrasion Test ^(Note 1) , 6 day, grams/sq. ft.	ASTM D3910	15 max

~~Notes~~

~~Wet track abrasion patties shall be produced by two applications of sealcoat material dried to constant weight between each coat.~~

~~End of Section~~

PRESERVATIVE SEAL FOR ASPHALT CONCRETE**718.1 GENERAL**

Asphalt Concrete preservative seal shall be one of the following types or equal, with typical application rates. Sealcoating material shall meet the requirements of section 718.3

TYPE A - Asphalt rejuvenating agent shall be an emulsion composed of a petroleum resin oil base uniformly emulsified with water. Each supplier must submit a certified statement from the asphalt rejuvenator manufacturer showing that the asphalt rejuvenating emulsion conforms to the required physical and chemical requirements. They also must provide documentation of tests that determine the acceptable range of application of the product. Typical application rates are 0.07 to 0.18 gallons per square yard.

TYPE B - Petroleum Hydrocarbon emulsion. Applied at 0.05 to 0.20 gallons per square yard, diluted.

TYPE C - Tire modified surface sealer (TRMSS) or equal not diluted, and applied at a rate of 0.10 to 0.20 gallons per square yard.

TYPE D - Acrylic polymer modified emulsion Diluted to the manufacture's recommendation and applied at a rate of 0.08 to 0.20 gallons per square yard.

TYPE E - Polymer modified rejuvenating emulsion. (PMRE) Diluted to the manufacture's recommendation and applied at a rate of 0.08 to 0.20 gallons per square yard.

718.2 TEST METHODS AND REQUIREMENTS PRESERVATIVE SEAL

Preservative seal for asphalt concrete material, shall meet type A, B, C, D or E on Table [718-1](#) by certification from the manufacturer.

Tests shall be performed by AMRL accredited laboratory, accredited in the specified test being performed.

TABLE 718-1						
PRESERVATIVE SEAL SPECIFICATIONS						
Properties	Method	Type-A	Type-B	Type-C	Type-D	Type-E
Saybolt Viscosity @77°F (sfs)	ASTM D244	15-40	25-150	200-2000 Cp (Note 1)	15-40	50-150
Sieve test %	ASTM D244	0.1 max				
Storage Stability, 24 hours, %	ASTM D244					1.0 max
Settlement test, 5 days, %	ASTM D244		2.0 max		5.0 max	
Test on residue by:		ASTM D244 Evaporation To 138°C	ASTM D244 Distillation To 177°C			
Residue Content, %	ASTM D244	60 min	62 min	30 min	53 min	65 min
Oil Distillate, % by volume	ASTM D244					0.5 max
Flash point (Note 2) °F	ASTM D92	400°F	450°F	450°F	450°F	
Softening point, °F	ASTM D5			140 min.	130 min	
Viscosity (Note 3), 60C, Poise	ASTM D2171					5000 max
Elastic Recovery (Note 4), 10C, %	AASHTO T301					50 min

TABLE 718-1						
PRESERVATIVE SEAL SPECIFICATIONS						
Properties	Method	Type-A	Type-B	Type-C	Type-D	Type-E
Test on residue by:		ASTM D244 Evaporation To 138°C	ASTM D244 Evaporation To 138°C	ASTM D244 Evaporation To 138°C	ASTM D244 Evaporation To 138°C	ASTM D244 Distillation To 177°C
Ductility, 25C, 5 cm/min, cm	ASTM D113			.	20 min	
Penetration, 25C, 100g/5 sec, dmm	ASTM D5				20-80	
Penetration, 4C, 200g/60 sec, dmm	ASTM D5					20-70
Kinematic Viscosity, 140°F, cSt	ASTM D2170	100-200	1,000-9,500			
Accelerated Weathering test ^(Note 5)	ASTM D4799				Plant certification within 12 months	
Test on		Evaporative Residue	Evaporative Residue			Rejuvenating Agent Base
Asphaltenes, % w	ASTM D2006	1.0 max	10.0 Max.			1.0 max
Maltene Dist. Ratio (PC+A ₁)/(A ₂ +S)	ASTM D2006	0.3-0.6	0.2-1.4			
PC/S Ratio	ASTM D2006	0.5 min	0.5 min.			
Saturated Hydrocarbons, S	ASTM D2006	28 max	28 max.			30 max
Kinematic Viscosity, 140°F, cSt	ASTM D2170					50-175
Flash point °F	ASTM D92					375 min
Test on residue from RTFO:	ASTM D2872					Rejuvenating Agent Base
Mass Change, %	ASTM D2872					6.5 max
Kinematic Viscosity, 140°F, cSt	ASTM D2170					Report
Kinematic Viscosity, Ratio ^(Note 6)						3.0 max

Notes:

1. Brookfield viscosity using spindle #27 (ASTM D4402) test temperature at 140°F temperature equilibrate the sample for a minimum of 20 minutes. Sample test time is at 5 minutes inside the Brookfield viscosity tube.
2. Flash point on residue may be waived by the engineer during production sampling and testing provided manufacturer submits results performed in the previous 12 months in compliance.
3. Viscosity in poise may be determined using AASHTO T315 by converting the Complex Dynamic Shear Viscosity to Viscosity in poise.
4. Elastic Recovery molds shall have straight sides as shown in Fig. 1 of AASHTO T301.
5. Other Accelerated Weathering test procedures may be presented for acceptance by the engineer prior to project start. These results shall be provided at no additional cost to the agency.
6. Kinematic Viscosity Ratio will be determined by dividing the viscosity of the material after RTFO aging by the original viscosity.

-End of Section-