State: Oklahoma	**Materials:** Re: Section 708.03 - Asphalt Materials
Date: 6/12/24	**Web Address:** https://oklahoma.gov/odot/business-center/construction/construction-engineering.html
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Oklahoma		**Table 1: Requirements for Anionic Emulsified Asphalts (1)**							
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**		**Medium-Setting**			**Slow-Setting**		**Quick-Setting**
			RS-1	**RS-2**	**MS-1**	**MS-2**	**MS-2h**	**SS-1**	**SS-1h**	**QS-1H**
EMULSIONS:										
Viscosity, Saybolt Furol seconds	25° C (77° F)	T59	20-100	-	20-100	100 min.	100 min.	20-100	20-100	20-100
	50° C (122° F)		-	150-400	-	-	-	-	-	-
Settlement, 5 days, %			-	-	-	-	-	-	-	-
Storage Stability Test, 24 hours, % (2)			1 max.	1 max.	1 max.	1 max.	1 max.	1 max.	1 max.	-
Sieve Test, % (2,3)			0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.
Demulsibility, % (4)			60 min.	60 min.	-	-	-	-	-	-
Cement Mixing Test, %			-	-	-	-	-	2.0 max.	2.0 max.	-
Coating Ability and Water Resistance	Dry Aggregate		-	-	Good	Good	Good	-	-	-
	After Spraying		-	-	Fair	Fair	Fair	-	-	-
	Wet Aggregate		-	-	Fair	Fair	Fair	-	-	-
	After Spraying		-	-	Fair	Fair	Fair	-	-	-
Residue, % (5)			55 min.	63 min.	55 min.	65 min.	65 min.	57 min.	57 min.	57 min.
DISTILLATION/EVAPORATION RESIDUE:										
Penetration, 25º C (77° F), tenths of mm		T49	100-200	100-200	100-200	100-200	40-90	100-200	40-90	40-90
Ductility, 25º C (77° F), cm		T51	40 min.	40 min.	40 min.	40 min.	40 min.	40 min.	40 min.	40 min.
Solubility in trichloroethylene or n-propyl bromide, %		T44	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.
NOTES:		1. Refer to R5 for typical applications. 2. This test requirement on representative samples is waived if successful application of the material has been achieved in the field. 3. A maximum percentage of 0.30 is acceptable for samples taken at the point of use. 4. The demulsibility test shall be performed within 30 days from the date of shipment. Use 35 ml, 0.02 *N* $CaCl_2$ solution. 5. Residue may be obtained by distillation or evaporation.								

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Oklahoma		Table 2: Requirements for Cationic Emulsified Asphalts (1)							
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**		**Medium-Setting**		**Slow-Setting**		**Quick-Setting**
			CRS-1	**CRS-2**	**CMS-2**	**CMS-2h**	**CSS-1**	**CSS-1h**	**CQS-1h**
EMULSIONS:									
Viscosity, Saybolt Furol seconds	25° C (77° F)	T59	-	-	-	-	20-100	20-100	20-100
	50° C (122° F)		20-100	150-400	50-450	50-450	-	-	-
Settlement, 5 days, %			-	-	-	-	-	-	-
Storage Stability Test, 24 hours, % (2)			1 max.	1 max.	1 max.	1 max.	1 max.	1 max.	-
Sieve Test, % (2)			0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.
Particle Charge (3)			Positive	Positive	Positive	Positive	Positive	Positive	Positive
Demulsibility , % (4)			40 min.	40 min.	-	-	-	-	-
Cement Mixing Test, %			-	-	-	-	2.0 max.	2.0 max.	-
Coating Ability and Water Resistance	Dry Aggregate		-	-	Good	Good	-	-	-
	After Spraying		-	-	Fair	Fair	-	-	-
	Wet Aggregate		-	-	Fair	Fair	-	-	-
	After Spraying		-	-	Fair	Fair	-	-	-
Residue, % (5)			60 min.	65 min.	65 min.	65 min.	57 min.	57 min.	57 min.
Oil Distillate, volume of emulsion, %			3 max.	3 max.	12 max.	12 max.	-	-	-
pH (3)		T200	6.7 max.	6.7 max.	6.7 max.	6.7 max.	6.7 max.	6.7 max.	6.7 max.
DISTILLATION/EVAPORATION RESIDUE:									
Penetration, 25º C (77° F), tenths of mm		T49	100-250	100-250	100-250	40-90	100-250	40-90	40-90
Ductility, 25º C (77° F), cm		T51	40 min.	40 min.	40 min.	40 min.	40 min.	40 min.	40 min.
Solubility in trichloroethylene, %		T44	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.

NOTES:

1. Refer to R5 for typical applications.
2. This test requirement on representative samples is waived if successful application of the material has been achieved in the field.
3. If the Particle Charge test is inconclusive, the Department's Materials Division will approve material with a maximum pH of 6.7.
4. Perform the demulsibility test within 30 days of shipment. Use 35 ml of 0.8% sodium dioctyl sulfosuccinate solution.
5. Residue may be obtained by distillation or evaporation.

Oklahoma		Table 3: Requirements for High Float Emulsified Asphalt (1)					
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**	**Medium-Setting**			
			HFRS-2	**HFMS-1**	**HFMS-2**	**HFMS-2h**	**HFMS-2s**
EMULSIONS:							
Viscosity, Saybolt Furol seconds	25° C (77° F)	T59	-	20-100	100 min.	100 min.	50 min.
	50° C (122° F)		75-400	-	-	-	-
Storage Stability Test, 24 hours, % (2)			1 max.	1 max.	1 max.	1 max.	1 max.
Sieve Test, % (2,3)			0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.
Demulsibility , % (4)			60 min.	-	-	-	-
Coating Ability and Water Resistance	Dry Aggregate		-	Good	Good	Good	Good
	After Spraying		-	Fair	Fair	Fair	Fair
	Wet Aggregate		-	Fair	Fair	Fair	Fair
	After Spraying		-	Fair	Fair	Fair	Fair
Residue, % (5)			63 min.	55 min.	65 min.	65 min.	65 min.
Oil Distillate, volume of emulsion, %			-	-	-	-	1-7
DISTILLATION/EVAPORATION RESIDUE:							
Penetration, 25º C (77° F), tenths of mm		T49	100-200	100-200	100-200	40-90	200 min.
Ductility, 25º C (77° F), cm		T51	40 min.	40 min.	40 min.	40 min.	40 min.
Solubility in trichloroethylene, % (6)		T44	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.
Float Test at 60° C (140° F), seconds		T50	1200 min.	1200 min.	1200 min.	1200 min.	1200 min.

NOTES:

1. Refer to R5 for typical applications.
2. This test requirement on representative samples is waived if successful application of the material has been achieved in the field.
3. A maximum percentage of 0.30 is acceptable for samples taken at the point of use.
4. The demulsibility test shall be performed within 30 days from the date of shipment. Use 35 ml, 0.02 *N* $CaCl_2$ solution.
5. Residue may be obtained by distillation or evaporation.
6. N-propyl bromide may also be used for HFRS-2.

Oklahoma		Table 4: Requirements for Polymer Modified Cationic Asphalt Emulsions			
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**		**Slow-Setting**
			PMCRS-1s	**PMCRS-2s (1)**	**PMCSS-1h**
EMULSIONS:					
Viscosity, Saybolt Furol Seconds	25 °C (77 °F)	T59	-	-	20-100
	50 °C (122 °F)		25-125	125-400	-
Settlement, 5 days, % (2)			-	5 max.	-
Storage Stability Test, 24 hours, %			1 max.	-	1 max.
Sieve Test, %			0.05 max.	0.10 max.	0.10 max.
Particle Charge Test			-	Positive	Positive
Demulsibility, %			60 min.	60 min.	-
Residue, % (3,4)		T59	63 min.	65 min.	62 min.
Oil Distillate, volume of emulsion, %			2 max.	2 max.	0.5 max.
DISTILLATION/EVAPORATION RESIDUE (5):					
Penetration, 25 ºC (77 °F), tenths of mm		T49	90-150	100-200	40-90
Ductility, 25 ºC (77 °F), cm	4 ºC (39.2 °F)	T51	-	30 min.	-
	25 ºC (77 °F)		-	-	70 min.
Elastic Recovery, 10 ºC (50 °F), %		OHD L-42	60 min.	58 min.	-
Tensile Strength at 800% elongation, 4 ºC (39.2 °F), 50 cm/min, kPa		-	-	196 min.	-
Softening Point (Ring and Ball), ºC (°F)		T53	-	44 (112) min.	57 (135) min.
Solubility in trichloroethylene, % (6)		T44	97.5 min.	-	97 min.
Ash Content, %		-	-	1.0 max.	-

NOTES:

1. Provide a Type B certification for each polymer modified asphalt lot in accordance with Subsection 106.04.
2. After the test cylinder stands undisturbed for 5 days, ensure that there is no milky colored substance and there is a homogeneous brown color throughout the cylinder.
3. Modify the distillation procedure as follows: Maintain a temperature from 345 °F (174 °C) to 355 °F (180 °C) on the lower thermometer for the last 20 minutes of the test. Maintain a test duration from 50 to 70 minutes from the first application of heat.
4. Residue may also be obtained by evaporation.
5. Ensure the distillation residue of the modified emulsion contains at least 3% polymer solids by asphalt mass as determined by an analytical method approved by the Department.
6. An organic solvent may be used.

Oklahoma		Table 5: Requirements for Non-Tracking Tack Coat Materials				
Property		**Test Method**	**CBC-1H**	**NTSS-1HM**	**NTQS-1HM**	**NTHAP**
EMULSIONS:						
Viscosity, Saybolt Furol seconds	25° C (77° F)	T59	10-100	15-100	15-100	-
	50° C (122° F)		-	-	-	-
Storage Stability Test, 24 hours, %			1 max.	1 max.	1 max.	-
Sieve Test, %			0.10 max.	0.30 max.	0.30 max.	-
Particle Charge			Positive	-	-	-
Residue, % (1,2)			50 min.	50 min.	50 min.	-
DISTILLATION/EVAPORATION RESIDUE:						
Penetration, 25º C (77° F), tenths of mm, 100g, 5s		T49	40-90	20 max.	15 max.	25 max.
Softening Point (Ring and Ball), ºC (°F)		T53	-	65 (149) mn.	65 (149) min.	70 (158) min.
Solubility in trichloroethylene, %		T44	97.5 min.	97.5 min.	97.5 min.	-
Flash Point, º C		T48	-	-	-	260 min.
Original DSR (G*/sin δ, 10 rad./sec)		T315	-	1.00 min.	1.00 min.	1.00 min.
Rotational Viscosity, Pa·s (3)	149° C (300° F)	T316	-	-	-	3.0 max.
NOTES:		1. Residue may be obtained by distillation or evaporation. 2. Modify distillation procedure as follows: Maintain a temperature from 345° F (174° C) to 355° F (180° C) on the lower thermometer for the last 20 minutes of the test. 3. This test requirement on representative samples is waived if successful application of the material has been achieved in the field.				