State: Texas	**Materials:** Item 300 – Asphalt, Oils, and Emulsions
Date: 6/13/2024	**Web Address:** https://www.txdot.gov/business/resources/txdot-specifications.html
Division Director: Ryan Barborak	**Contact Info:** Pravat Karki, Pravat.Karki@txdot.gov

Texas		**Table 1: Requirements for Emulsified Asphalts (TxDOT Item 300 Table 7)**			
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**	**Medium-Setting**	**Slow-Setting**	
			HFRS-2	**MS-2**	**SS-1**	**SS-1H**
EMULSIONS:						
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T72	-	-	20-100	20-100
	50 °C (122 °F)		150-400	100-300	-	-
Settlement, 5 days, %		T59	-	-	-	-
Storage Stability Test, 1 day, %			1 max.	1 max.	1 max.	1 max.
Sieve Test, %			0.1 max.	0.1 max.	0.1 max.	0.1 max.
Demulsibility, 35 mL of 0.02 N $CaCl_2$, %			50 min.	30 max.	-	-
Cement Mixing Test, %			-	-	2.0 max.	2.0 max.
Miscibility			-	-	Pass	Pass
Freezing Test, 3 cycles	(1)		-	Pass	Pass	Pass
Residue, %			65 min.	65 min.	60 min.	60 min.
Oil Distillate, volume of emulsion, %			0.5 max.	0.5 max.	0.5 max.	0.5 max.
DISTILLATION RESIDUE:						
Penetration, 25 ºC (77 °F), tenths of mm		T49	100-140	90-160	90-160	40-100
Ductility, 25 ºC (77 °F), cm		T51	100 min.	100 min.	100 min.	80 min.
Solubility, %		T44	97.5 min.	97.5 min.	97.5 min.	97.5 min.
Float Test, 60 ºC (140 °F), sec.		T50	1200 min.	-	-	-
NOTES:		1. Applies only when the Engineer designates material for winter use.				

Texas		Table 2: Requirements for Cationic Emulsified Asphalts (TxDOT Item 300 Table 8)				
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**	**Medium-Setting**	**Slow-Setting**	
			CRS-2	**CMS-2**	**CSS-1**	**CSS-1H**
EMULSIONS:						
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T72	-	-	20-100	20-100
	50 °C (122 °F)		150-400	100-350	-	-
Settlement, 5 days, %		T59	-	-	-	-
Storage Stability Test, 1 day, %			1 max.	1 max.	1 max.	1 max.
Sieve Test, %			0.1 max.	0.1 max.	0.1 max.	0.1 max.
Particle Charge			Positive	Positive	Positive	Positive
Demulsibility , % (1)			70 min.	-	-	-
Cement Mixing Test, %			-	-	2.0 max.	2.0 max.
Coating Ability and Water Resistance	Dry Aggregate		-	Good	-	-
	After Spraying		-	Fair	-	-
	Wet Aggregate		-	Fair	-	-
	After Spraying		-	Fair	-	-
Residue, %			65 min.	65 min.	60 min.	60 min.
Oil Distillate, volume of emulsion, %			0.5 max.	7 max.	0.5 max.	0.5 max.
pH		-	-	-	-	-
DISTILLATION RESIDUE:						
Penetration, 25 ºC (77 °F), tenths of mm		T49	90-160	90-200	90-160	40-110
Ductility, 25 ºC (77 °F), cm		T51	100 min.	100 min.	100 min.	80 min.
Solubility, %		T44	97.5 min.	97.5 min.	97.5 min.	97.5 min.
NOTES:		1. Use 35 ml of 0.8% sodium dioctyl sulfosuccinate solution.				

Texas		Table 3: Requirements for Polymer Modified Anionic Asphalt Emulsions (TxDOT Item 300 Table 9)	
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**
			HFRS-2P
EMULSIONS:			
Viscosity, Saybolt Furol Seconds, range	25 °C (77 °F)	T72	-
	50 °C (122 °F)		150-400
Storage Stability Test, 1 day, %		T59	1 max.
Sieve Test, %			0.1 max.
Demulsibility, % (1)			50 min.
Miscibility			-
Coating Ability and Water Resistance	Dry Aggregate		-
	After Spraying		-
	Wet Aggregate		-
	After Spraying		-
Residue, % (2)		T59	65 min.
Oil Distillate, volume of emulsion, %			0.5 max.
DISTILLATION RESIDUE:			
Penetration, 25 ºC (77 °F), tenths of mm		T49	90-140
Ductility, 4 ºC (39.2 °F), 5 cm/min., cm (3)		T51	50 min.
Elastic Recovery, 10 °C (50 °F), % (3)		Tex-539-C	55 min.
Viscosity, 60 °C (140 °F), poise		T202	1500 min.
Solubility, %		T44	97.0 min.
Polymer Content, wt. % (solids basis)		Tex-533-C	3.0 min.
Float Test at 60 °C (140 °F), seconds		T50	1200 min.
NOTES:		1. Use 35 ml of 0.02 *N* $CaCl_2$ solution. 2. Exception to T59: Bring the temperature on the lower thermometer slowly to 350 °F ± 10 °F. Maintain at this temperature for 20 minutes. Complete total distillation in 60 ± 5 minutes from the first application of heat. 3. Must meet one of either the Ductility or Elastic Recovery requirements.	

Texas		Table 5: Requirements for Polymer Modified Cationic Asphalt Emulsions (TxDOT Item 300 Table 10)						
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**			**Medium-Setting**		**Slow-Setting**
			CRS-2P	**CHFRS-2P**	**CRS-2TR**	**CMS-1P (1)**	**CMS-2P (1)**	**CSS-1P**
EMULSIONS:								
Viscosity, Saybolt Furol Seconds, range	25 °C (77 °F)	T72	-	-	-	10-100	-	20-100
	50 °C (122 °F)		150-400	100-400	150-500	-	50-400	-
Settlement, 5 days, %		T59	-	-	-	-	-	-
Storage Stability Test, 1 day, %			1 max.	1 max.	1 max.	1 max.	1 max.	1 max.
Sieve Test, %			0.1 max.	0.1 max.	0.1 max.	0.1 max.	0.1 max.	0.1 max.
Particle Charge			Positive	Positive	Positive	Positive	Positive	Positive
Demulsibility, % (2)			70 min.	60 min.	40 min.	-	-	-
Miscibility			-	-	-	-	-	-
Residue, % (3)		T59	65 min.	65 min.	65 min.	30 min.	60 min.	62 min.
Oil Distillate, volume of emulsion, %			0.5 max.	0.5 max.	3 max.	0.5 max.	0.5 max.	0.5 max.
DISTILLATION RESIDUE:								
Penetration, tenths of mm	4 ºC (39.2 °F)	T49	-	-	-	-	-	-
	25 ºC (77 °F)		90-150	80-130	90-150	30 min.	30 min.	55-90
Ductility, 5 cm/min., cm	4 ºC (39.2 °F) (4)	T51	50 min.	-	-	-	-	-
	25 ºC (77 °F)		-	-	40 min.	-	-	70 min.
Elastic Recovery, 10 °C (50 °F), % (4)		Tex-539-C	55 min.	55 min.	-	-	-	-
Viscosity, 60 °C (140 °F), poise		T202	1300 min.	1300 min.	1000 min.	-	-	-
Softening Point, °F		T53	-	-	-	-	-	-
Solubility, %		T44	97.0 min.	95.0 min.	98 min.	-	-	97.0 min.
Polymer Content, wt. % (solids basis)		Tex-533-C or Tex-553-C	3.0 min	3.0 min.	5.0 min. (5)	-	-	3.0 min.
Float Test at 60 °C (140 °F), seconds		T50	-	1800 min.	-	-	-	-

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Texas	Table 5: Requirements for Polymer Modified Cationic Asphalt Emulsions (Cont.)						
Property	**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**			**Medium-Setting**		**Slow-Setting**
		CRS-2P	**CHFRS-2P**	**CRS-2TR**	**CMS-1P (1)**	**CMS-2P (1)**	**CSS-1P**
EVAPORATION RESIDUE (R 78, Procedure B):							
Nonrecoverable creep compliance of residue, 3.2 kPa, 52°C, kPa-1	T350	-	-	-	2.0 max.	4.0 max.	-
REJUVENATING AGENT:							
Viscosity, 60 °C (140 °F), cSt	T201	-	-	-	-	-	-
Flash Point, C.O.C, °F	T48	-	-	-	-	-	-
Saturates, % by weight	D2007	-	-	-	-	-	-
Solubility in n-pentane, % by weight	D2007	-	-	-	-	-	-
REJUVENATING AGENT AFTER TFO OR RTFO:							
Weight Change, %	T240 or T179	-	-	-	-	-	-
Viscosity Ratio	T179	-	-	-	-	-	-
LATEX (7):							
Tensile Strength, die C dumbbell, psi	D412 (10)	-	-	-	-	-	-
Change in mass after immersion in rejuvenating agent, 48 hours, 104 °F, %	D471	-	-	-	--	-	-
NOTES:	1. With all precertification samples of CMS-1P or CMS-2P, submit certified test reports showing the type and percent of rejuvenator and/or latex added. Submit samples of these raw materials if requested by the Engineer. 2. Use 35 ml of 0.8% sodium dioctyl sulfosuccinate solution. 3. Exception to T59: Bring the temperature on the lower thermometer slowly to 350 °F ± 10 °F. Maintain at this temperature for 20 minutes. Complete total distillation in 60 ± 5 minutes from the first application of heat. 4. Must meet one of either the Ductility or Elastic Recovery requirements. 5. Modifier type is tire rubber. Determined in accordance with Tex-553-C.						

Texas		Table 6: Requirements for Specialty Emulsions (TxDOT Item 300 Table 11)			
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Medium-Setting**		**Slow-Setting**
			AE-P	**EAP&T**	**PCE (1)**
EMULSIONS:					
Viscosity, Saybolt Furol Seconds	25 °C (77 °F)	T72	-	-	10-100
	50 °C (122 °F)		15-150	-	-
Storage Stability Test, 1 day, %		T59	1 max.	1 max.	-
Sieve test, %			0.1 max.	0.1 max.	0.1 max.
Demulsibility, % (2)			70 max.	-	-
Miscibility (3)			-	Pass	Pass
Particle Size, % by volume < 2.5 µm (5)		Tex-238-F (4)	-	90 min.	90 min.
Residue after both distillations, % by wt.		T59 and T78	40 min.	-	-
Total Oil Distillate from both distillations, % by volume of emulsion			25-40	-	-
Residue, %	Distillation	T59	-	60 min.	-
	Evaporation (6)		-	-	60 min.

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Texas	Table 6: Requirements for Specialty Emulsions (Cont.)			
Property	**Test Method AASHTO (T), ASTM (D), or Other**	**Medium-Setting**		**Slow-Setting**
		AE-P	**EAP&T**	**PCE (1)**
RESIDUE FROM DISTILLATION/EVAPORATION:				
Viscosity, 60 °C (140 °F), poise	T202	-	800 min.	-
Kinematic Viscosity, 60 °C (140 °F), cSt (5)	T201	-	-	100-350
Flash Point C.O.C., °F	T48	-	-	400 min.
Solubility, %	T44	97.5 min.	-	-
Float Test at 50 °C (122 °F), seconds	T50	50-200	-	-
NOTES:	1. Supply with each shipment of PCE: a) a copy of a lab report from an approved analytical lab, signed by a lab official, indicating the PCE formulation does not meet any characteristics of a Resource Conservation Recovery Act (RCRA) hazardous waste, b) a certification from the producer that the formulation supplied does not differ from the one tested and that no listed RCRA hazardous wastes or PCBs have been mixed with the product, and c) a Materials Safety Data Sheet. 2. Use 35 ml of 0.10 *N* $CaCl_2$ solution. 3. Exception to T59: In dilution, use 350 ml of distilled or deionized water and a 1000 ml beaker. 4. Use Tex-238-F, beginning at “Particle Size Analysis by Laser Diffraction”, with distilled or deionized water as a medium and no dispersant, or use another approved method. 5. PCE must meet either the Kinematic Viscosity requirement or the Particle Size requirement. 6. Exception to T59: Leave sample in the oven until foaming ceases, then cool and weigh.			

Texas		Table 7: Requirements for Non-Tracking Tack Coat Emulsion (1) (TxDOT Item 300 Table 10A)			
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Quick Setting**		
			NT-HRE	**NT-RRE**	**NT-SRE**
EMULSIONS:					
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T72	15 min.	15 min.	10-100
	50 °C (122 °F)		-	-	-
Storage Stability Test, 24 hours, %		T59	1 max.	1 max.	1 max.
Settlement, 5-day, %			5 max.	5 max.	5 max.
Sieve Test, %			0.30 max.	0.30 max.	0.1 max.
Demulsibility, %			-	-	-
Residue, %	(2)		50 min.	58 min.	50 min.
Oil Distillate, volume of emulsion, %			1.0 max.	1.0 max.	1.0 max.
DISTILLATION RESIDUE:					
Penetration, 25 ºC (77 °F), tenths of mm		T49	20 max.	15-45	40-90
Solubility, %		T44	97.5 min.	97.5 min.	97.5 min.
Dynamic Shear, G*/sin δ, 82 ºC, 10 rad/s, kPa		T315	1.0 min.	-	-
NOTES:		1. These are emulsion-based TRAILs. Due to the hardness of the residue, these emulsions should be heated to 120–140° F prior to thorough mixing as the emulsion is being prepared for testing. 2. Exception to AASHTO T-59: Bring the temperature on the lower thermometer slowly to 350 °F +/- 10 °F. Maintain at this temperature for 20 min. Complete total distillation in 60 +/- 5 min. from first application of heat.			