

State: California	Specification: Section 94-Asphaltic Emulsions (starting on page 1019)
Date: 1-22-21	Web Address: www.dot.ca.gov/hq/esc/oe/specifications/std_specs/2010_StdSpecs/
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California		Table 1: Requirements for Anionic Emulsified Asphalts		
Property		Test Method AASHTO (T), ASTM (D), or Other	Slow-Setting	
			SS-1	SS-1h
EMULSIONS:				
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	20-100	20-100
	50 °C (122 °F)		-	-
Settlement, 5 days, %				
Storage Stability Test, 1 day, %			1 max.	1 max.
Sieve Test, %			0.10 max.	0.10 max.
Demulsibility, %			-	-
Cement Mixing Test, %			2.0 max.	2.0 max.
Coating Ability and Water Resistance	Dry Aggregate		-	-
	After Spraying		-	-
	Wet Aggregate		-	-
	After Spraying		-	-
Residue from distillation or evaporation test, %			57 min. (1)	57 min. (1)
Oil Distillate, volume of emulsion, %			-	-
RESIDUE:				
Penetration, 25 °C (77 °F), tenths of mm		T49	100-200	40-90
Ductility, 25 °C (77 °F), (min, mm)		T51	400	
Solubility in trichloroethylene, %		T44	97.5 min.	
NOTES:		1. Distillation is the defining test if there is a conflict with evaporation.		

California		Table 2: Requirements for Cationic Emulsified Asphalts						
Property		Test Method AASHTO (T), ASTM (D), or Other	Rapid-Setting				Slow-Setting	
			CRS-1	CRS-1h	CRS-2	CRS-2h	CSS-1	CSS-1h
EMULSIONS:								
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	-	-			20-100	20-100
	50 °C (122 °F)		20-100	20-100	100-400	100-400		
Settlement, 5 days, %			-					
Storage Stability Test, 1 day, %			1 max.					
Sieve Test, %			0.10 max.					
Particle Charge			Positive					
Demulsibility , %	(2)		40 min.	40 min.	40 min.	40 min.	-	-
Cement Mixing Test, %			-	-			2.0 max.	2.0 max.
Residue from distillation or evaporation, %	(1)		60 min.	60 min.	65 min.	65 min.	57 min.	57 min.
Oil Distillate, volume of emulsion, %			-					
pH		T200	-					
RESIDUE:								
Penetration, 25 °C (77 °F), tenths of mm		T49	100-250 (3)	40-90	100-250	40-90	100-250	40-90
Ductility, 25 °C (77 °F), mm		T51	400 min.					
Solubility in trichloroethylene, %		T44	97.5 min.					
NOTES:		1. Must comply with a pH requirement of 6.7 maximum (ASTM E 70) if the particle charge test result is inconclusive. 2. The demulsibility test must be made within 30 days from date of shipment. Use 35 ml of 0.8% sodium dioctyl sulfosuccinate solution. 3. A harder base asphalt in compliance with the paving asphalt specifications may be specified if the test requirements on the residue from distillation are waived.						

California		Table 3: Requirements for Quick-Setting Asphaltic Emulsions				
Property		Test Method AASHTO (T), ASTM (D), or Other	Anionic		Cationic	
			QS-1	QS-1h	CQS-1	CQS-1h
EMULSIONS:						
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	-	-	-	-
	50 °C (122 °F)		15-90	15-90	15-90	15-90
Storage Stability Test, 24 hours, %			1 max.	1 max.	1 max.	1 max.
Sieve Test, %			0.30 max.	0.30 max.	0.30 max.	0.30 max.
Particle Charge Test (1)			-	-	Positive	Positive
Residue by distillation or evaporation, % (2)			57 min.			
RESIDUE:						
Penetration, 25 °C (77 °F), tenths of mm		T49	100-200	40-90	100-200	40-90
Ductility, 25 °C (77 °F), mm		T51	400 min.			
Solubility in trichloroethylene, %		T44	97 min.			
NOTES:		1. If the result of the Particle Charge Test is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E 70. Grade QS-1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS-1h asphaltic emulsion must have a maximum pH of 6.7. 2. Distillation is the defining test if there is a conflict with evaporation.				

California		Table 4: Requirements for Polymer Modified Asphaltic Emulsions				
Property		Test Method AASHTO (T), ASTM (D), or Other	Cationic			
			PMCQS-1h	MSE	PMCRS-2	PMCRS-2h
EMULSIONS:						
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	15-90	15-90	-	-
	50 °C (122 °F)		-	-	100-400	100-400
Storage Stability Test, 24 hours, %			1 max.	1 max.	1 max.	1 max.
Sieve Test, %			0.30 max.	0.30 max.	0.30 max.	0.30 max.
Particle Charge Test (3)			Positive	Positive	Positive	Positive
Demulsibility, %			-	-	40 min. (2)	40 min. (2)
Residue by Evaporation or Distillation, % (5)		T59	60 min.	62 min.	65 min.	65 min.
RESIDUE:						
Penetration, 4 °C, tenths of mm		T49	-	-	6 min.	6 min.
Penetration, 25 °C (77 °F), tenths of mm		T49	40-90	40-90	100-200	40-90
Ductility, 25 °C (77 °F), mm		T51	400 min.	-	400 min.	400 min.
Softening Point (min, °C)		T53	-	57	57	57
Torsional Recovery, % -or-		California Test 332	18 min.	20 min.	20 min.	20 min.
Elastic Recovery, 25°C (min, %) (4)		T301	60	65	65	65
NOTES:		1. Use 35 ml, 0.02 N CaCl ₂ solution. 2. Use 35 ml of 0.8% sodium dioctyl sulfosuccinate solution. 3. If the result of the Particle Charge Test is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E 70. Grade QS-1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS-1h asphaltic emulsion must have a maximum pH of 6.7. 4. Elastic Recovery is the defining test if there is a conflict with torsional recovery. 5. Distillation temperature of 350 °F).				

California		Table 5: Requirements for Cationic Emulsified Recycling Agent	
Property		Test Method AASHTO (T), ASTM (D), or Other	Emulsified Recycling Agent
EMULSIONS:			
Sieve Test, max. %		T59	0.10
Particle Charge Test (1)			Positive
Residue by Evaporation or Distillation, % (2)			63 min.
RESIDUE:			
Penetration, 25 °C (77 °F), tenths of mm		T49	40-120
Ductility, 25 °C (77 °F), mm		T51	400 min.
Creep Stiffness	Test temp.	T313	-12
	S-value, MPa		300 max.
	M-Value		0.300 min.
NOTES:		1. Must comply with a pH requirement of 6.7 maximum (ASTM E 70) if the particle charge test result is inconclusive. 2. Distillation is the defining test if there is a conflict with evaporation. Distillation temperature of 350 °F.	

California		Table 6: Requirements for Bonded Wearing Course Asphaltic Emulsion	
Property		Test Method AASHTO (T), ASTM (D), or Other	
EMULSIONS:			
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	20-100
	50 °C (122 °F)		-
Sieve Test, %			0.05
Storage Stability Test, 1 day, %			1 max.
Particle Charge Test (1)			Positive
Residue by Evaporation or Distillation, % (2)			63 min.
RESIDUE:			
Penetration, 25 °C (77 °F), tenths of mm		T49	70-150
Torsional Recovery (min, %) (3)		California Test 332	40
NOTES:		1. If the result of the Particle Charge Test is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E 70. Grade QS-1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS-1h asphaltic emulsion must have a maximum pH of 6.7. 2. Distillation is the defing test if there is a conflict with evaporation. Distillation temperature of 350 °F. 3. Measure the entire arc of recovery at 25 °C.	

California		Table 6: Requirements for Rapid-Setting Polymer-Modified Rejuvenating Asphaltic Emulsions	
Property		Test Method AASHTO (T), ASTM (D), or Other	PMRE
EMULSIONS:			
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	-
	50 °C (122 °F)		50-350
Sieve Test, %			0.30
Storage Stability Test, 24 hours, %			1 max.
Particle Charge Test (1)			Positive
Demulsibility (min, %) (5)			40
Residue by Evaporation or Distillation, % (2)			65 min.
Oil Distillate, % max.			0.5
pH		ASTM E70	2.0-5.0
RESIDUE:			
Viscosity, at 60 °C (max, Pa-s) (4)		T202	5000
Penetration, 4 °C, (dmm)		T49	40-70
Elastic Recovery, 25 °C (min, %) (3)		T301	60
NOTES:		1. If the result of the Particle Charge Test is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E 70. Grade QS-1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS-1h asphaltic emulsion must have a maximum pH of 6.7. 2. Distillation is the defining test if there is a conflict with evaporation. Distillation temperature of 350 °F. 3. Hour glass sides, pull to 20 cm, hold 5 minutes then cut, let sit 1 hour. 4. Use an AI-200 glass capillary tube to run the test. If the viscosity is 4000 or above, use an AI 400 instead. 5. If the product is to be diluted, demulsibility is waived.	
TABLE 6 CONTINUED ON NEXT PAGE →			

California	Table 6 Continued: Requirements for Rapid-Setting Polymer-Modified Rejuvenating Asphaltic Emulsions	
Property	Test Method AASHTO (T), ASTM (D), or Other	Rejuvenating Agent Requirements
TESTs ON REJUVENATING AGENT:		
Viscosity, at 60 °C (cSt)	T201	50-175
Flash Point (min, °C)	T48	193
Saturate (max, % by weight)	D2007	30
Asphaltenes (max)	D2007	1.0
TESTs ON REJUVENATING AGENT RTFO TEST RESIDUE:		
Weight change (max, %)	T240	6.5
Viscosity Ration (max) (1)	T240	3
NOTES:	1. RTFO viscosity divided by the original viscosity.	