

<b>State:</b> Wisconsin	<b>Materials:</b> Re: Section 455.2.4.3-Emulsified Asphalts
<b>Date:</b> 2-26-25	<b>Web Address:</b> www.dot.state.wi.us
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Wisconsin		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 (2)	MS-2h	SS-1 (2)	SS-1h (2)	QS-1H	
<b>EMULSIONS:</b>										
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)		-	75-400	-	-	-	-	-	-
Settlement, 5 days, %			-	-	-	-	-	-	-	-
Storage Stability Test, 24 hours, % (3)			1 max.	1 max.	1 max.	1 max.	1 max.	1 max.	1 max.	1 max.
Sieve Test, % (3,4)			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, % (5)			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, %		55 min.	63 min.	55 min.	65 min.	65 min.	57 min.	57 min.	57 min.	
<b>DISTILLATION RESIDUE:</b>										
Penetration, 25 °C (77 °F), tenths of mm		T49	100-200	100-200	100-200	100-200	40-90	100-200	40-90	40-90
Ductility, 25 °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.
<b>NOTES:</b>		<ol style="list-style-type: none"> <li>1. Refer to R5 for typical applications. If diluting emulsified asphalt, mix thoroughly with an equal amount of potable water. If undiluted samples are not available, test the diluted material and modify AASHTO M140, M208, or M316 to reflect properties resulting from dilution of the asphalt.</li> <li>2. Under the Tack Coat bid item, furnish type MS-2, SS-1, SS-1h, CSS-1, CSS-1h, or modified emulsified asphalt, unless the contract specifies otherwise.</li> <li>3. This test requirement on representative samples is waived if successful application of the material has been achieved in the field.</li> <li>4. A maximum percentage of 0.30 is acceptable for samples taken at the point of use.</li> <li>5. The demulsibility test shall be performed within 30 days from the date of shipment. Use 35 ml, 0.02 N CaCl<sub>2</sub> solution.</li> </ol>								

To ensure the most accurate and current information, the specific agency should be contacted.

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 (2)	CSS-1h (2)	CQS-1h	
<b>EMULSIONS:</b>									
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	-	-	-	-	20-100	20-100	20-100
	50 °C (122 °F)		20-100	100-400	50-450	50-450	-	-	-
Settlement, 5 days, %	-		-	-	-	-	-	-	
Storage Stability Test, 24 hours, % (3)	1 max.		1 max.	1 max.	1 max.	1 max.	1 max.	1 max.	
Sieve Test, % (3)	0.10 max.		0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.	
Particle Charge	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, %	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	T200	-	-	-	-	-	-	-	
<b>DISTILLATION RESIDUE:</b>									
Penetration, 25 °C (77 °F), tenths of mm	T49	100-250	100-250	100-250	40-90	100-250	40-90	40-90	
Ductility, 25 °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.	
<b>NOTES:</b>	<ol style="list-style-type: none"> <li>Refer to R5 for typical applications. If diluting emulsified asphalt, mix thoroughly with an equal amount of potable water. If undiluted samples are not available, test the diluted material and modify AASHTO M140, M208, or M316 to reflect properties resulting from dilution of the asphalt.</li> <li>Under the Tack Coat bid item, furnish type MS-2, SS-1, SS-1h, CSS-1, CSS-1h, or modified emulsified asphalt, unless the contract specifies otherwise.</li> <li>This test requirement on representative samples is waived if successful application of the material has been achieved in the field.</li> <li>Use 35 ml of 0.8% sodium dioctyl sulfosuccinate solution.</li> </ol>								

To ensure the most accurate and current information, the specific agency should be contacted.

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	
<b>EMULSIONS:</b>							
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	-	20-100	100 min.	100 min.	50 min.	
	50 °C (122 °F)	75-400	-	-	-	-	
Storage Stability Test, 24 hours, % (2)	T59	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, %		63 min.	55 min.	65 min.	65 min.	65 min.	
Oil Distillate, volume of emulsion, %		-	-	-	-	1-7	
<b>DISTILLATION RESIDUE:</b>							
Penetration, 25 °C (77 °F), tenths of mm	T49	100-200	100-200	100-200	40-90	200 min.	
Ductility, 25 °C (77 °F), cm	T51	40 min.	40 min.	40 min.	40 min.	40 min.	
Solubility in trichloroethylene, % (5)	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.	
<b>NOTES:</b>	<ol style="list-style-type: none"> <li>1. Refer to R5 for typical applications. If diluting emulsified asphalt, mix thoroughly with an equal amount of potable water. If undiluted samples are not available, test the diluted material and modify AASHTO M140, M208, or M316 to reflect properties resulting from dilution of the asphalt.</li> <li>2. This test requirement on representative samples is waived if successful application of the material has been achieved in the field.</li> <li>3. A maximum percentage of 0.30 is acceptable for samples taken at the point of use.</li> <li>4. The demulsibility test shall be performed within 30 days from the date of shipment. Use 35 ml, 0.02 N CaCl<sub>2</sub> solution.</li> <li>5. N-propyl bromide may also be used for HFRS-2.</li> </ol>						

Wisconsin		Table 4: Requirements for Polymer Modified Asphalt Emulsions (1)		
Property		Test Method AASHTO (T), ASTM (D), or Other	Rapid-Setting	
			CRS-2P	CRS-2L
<b>EMULSIONS:</b>				
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	-	-
	50 °C (122 °F)		100-400	100-400
Settlement, 5 days, %			-	-
Storage Stability Test, 24 hours, %			1 max.	1 max.
Sieve Test, %			0.10 max.	0.10 max.
Particle Charge Test			Positive	Positive
Demulsibility, %			40 min.	40 min.
Residue by Distillation, %			T59	65 min.
<b>DISTILLATION RESIDUE:</b>				
Penetration, 25 °C (77 °F), tenths of mm		T49	100-175	100-175
Ductility, 5 cm/minute, cm	4 °C (39.2 °F)	T51	30 min.	30 min.
	25 °C (77 °F)		125 min.	125 min.
Force Ratio (f2/f1)		T300	0.30 min.	-
Elastic Recovery, 25 °C (77 °F), %		T301	50 min.	-
Polymer Solids content, %		-	2.5 min.	2.5 min.
Solubility in Trichloroethylene, %		T44	97.5 min. (1)	97.5 min. (1)
<b>NOTES:</b>		<ol style="list-style-type: none"> <li>1. If diluting emulsified asphalt, mix thoroughly with an equal amount of potable water. If undiluted samples are not available, test the diluted material and modify AASHTO M140, M208, or M316 to reflect properties resulting from dilution of the asphalt.</li> <li>2. If the solubility of the residue is less than 97.5 percent, the base asphalt binder for the emulsion shall be tested. The solubility of the base asphalt binder shall be greater than 99%.</li> </ol>		