



MATERIAL SPECIFICATION FOR EMULSIFIED ASPHALTS

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1103-A	Commentary
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1103.01	SCOPE
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1103.01.01	General
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This specification covers the requirements for different types and grades of emulsified asphalt suitable for both roadway construction and as a straw mulch adhesive.

1103.01.02	Specification Significance and Use
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This specification is written as a municipal-oriented specification. Municipal-oriented specifications are developed to reflect the administration, testing, and payment policies, procedures, and practices of many municipalities in Ontario.

Use of this specification or any other specification shall be as specified in the Contract Documents.

1103.01.03	Appendices Significance and Use
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Appendices are not for use in provincial contracts as they are developed for municipal use, and then, only when invoked by the Owner.

Appendices are developed for the Owner's use only.

Inclusion of an appendix as part of the Contract Documents is solely at the discretion of the Owner. Appendices are not a mandatory part of this specification and only become part of the Contract Documents as the Owner invokes them.

Invoking a particular appendix does not obligate an Owner to use all available appendices. Only invoked appendices form part of the Contract Documents.

The decision to use any appendix is determined by an Owner after considering their contract requirements and their administrative, payment, and testing procedures, policies, and practices. Depending on these considerations, an Owner may not wish to invoke some or any of the available appendices.

1103.02 REFERENCES

When the Contract Documents indicate that municipal-oriented specifications are to be used and there is a municipal-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.MUNI, unless use of a provincial-oriented specification is specified in the Contract Documents. When there is not a corresponding municipal-oriented specification, the references below shall be considered to be the OPSS listed, unless use of a provincial-oriented specification is specified in the Contract Documents.

This specification refers to the following standards, specifications, or publications:

Ontario Ministry of Transportation Publications

MTO Laboratory Testing Manual:

LS 208	Method of Test for Elastic Recovery by Durometer
LS 217	Method of Test for Determination of Oil Portion of Distillate of Emulsified Asphalts
LS 218	Method of Test for Particle Charge of Emulsified Asphalts and Emulsified Asphalt Primers
LS-220	Demulsibility of Emulsified Asphalts
LS 221	Method of Test for Settlement and Storage Stability of Emulsified Asphalt
LS-224	Coating Ability and Water Resistance for Emulsified Asphalts
LS-226	Test for High Float Emulsified Asphalt

ASTM International

D5/D5M-20	Penetration of Bituminous Materials
D36/D36M-14(2020)	Softening Point of Bitumen (Ring-and-Ball Apparatus)
D113/D113M-17(2023)	Ductility of Asphalt Materials
D1310-14(2021)	Flash Point and Fire Point of Liquids by Tag Open-Cup Apparatus
D6930-19(2024)	Settlement and Storage Stability of Emulsified Asphalts
D6933-22	Oversized Particles in Emulsified Asphalts (Sieve Test)
D6935-22	Determining Cement Mixing of Emulsified Asphalt
D6997-24	Distillation of Emulsified Asphalt
D7496-18	Viscosity of Emulsified Asphalt by Saybolt Furol Viscometer
D8078-24	Ash Content of Asphalt and Emulsified Asphalt Residues

American Association of State Highway and Transportation Officials (AASHTO)

R 66-16 (2024)	Standard Practice for Sampling Asphalt Materials
T 59-22	Emulsified Asphalts
T 300-22	Force Ductility Test of Asphalt Materials

Other

Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions for the Use of Cutback and Emulsified Asphalt.

1103.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Emulsified Asphalt means asphalt cement milled into microscopic particles and dispersed in water using a chemical emulsifier and other additives. Based on the electrical charges surrounding the asphalt particles, it can be anionic, cationic, and non-ionic. It can be classified based on setting time of the asphalt droplets (RS, MS, QS, SS), viscosity of the emulsions (1,2), hardness of the base asphalt cement (H, HH), polymer content (P), and float & flow properties (HF).

Ozone Season means the period of May 1st through September 30th (warm-season months, when the days are warmer and longer), as defined in the Ozone Annex (2000) of the Canada-United States Air Quality Agreement (1991).

Tack Coat means an emulsified asphalt applied to the surface of a new or existing asphalt layer to enhance the bond between the asphalt layers, prior to placing an overlaying layer.

Volatile Organic Compounds (VOC) means the Item 65 components on the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999 (CEPA 1999).

1103.05 MATERIALS

1103.05.01 General

Emulsified asphalt shall be of the type and grade specified in the Contract Documents and shall be supplied from a source named on the Ministry of Transportation's Designated Sources for Materials (DSM) or approved by the Owner. The source of supply or the product shall not be changed, or partial or total supply allocated to another supplier without prior written approval of the Owner.

1103.05.02 Physical Requirements

Emulsified asphalts shall consist of suitable paving asphalts dispersed in water and shall meet the requirements specified in Tables 1 to 6. The addition of polymers or other additives after the manufacture of an emulsified asphalt shall not be permitted.

Emulsified asphalts and polymer-modified emulsified asphalts shall be homogeneous after mixing and show no signs of separation within 14 Days of delivery.

1103.05.03 Shipping

The material shall be shipped in clean containers. Containers that are being reused shall be inspected and cleaned, if required, prior to loading to ensure there is no contamination.

The material shall arrive at the destination at a temperature at least 5°C higher than the minimum spraying temperature specified in Table 7 and not more than the maximum spraying temperature specified in Table 7.

When no spraying temperatures are specified in Table 7, the material shall arrive at a temperature meeting the manufacturer's requirements.

1103.05.04 Straw Mulch Adhesive

Emulsified asphalt used as a straw mulch adhesive shall be a specially refined petroleum asphalt emulsified in water, of fluid consistency designed for cold spray applications, containing neither petroleum solvents nor other components toxic to plant life, and shall meet the requirements specified in Table 1.

1103.08 QUALITY ASSURANCE

1103.08.01 Compliance

Emulsified asphalts shall meet the requirements specified in Tables 1, 2, 3, 4, 5 and 6 for the particular type and grade when tested according to the test methods designated in the tables.

1103.08.02 Inspection

The Owner may inspect shipping containers for cleanliness at any time.

1103.08.03 Sampling

Representative samples of material being supplied may be taken, when specified in the Contract Documents, according to AASHTO R66 from either the supplier's plant or, any shipment in the presence of the Contract Administrator.

The samples shall remain in a condition that maintain their original physical and engineering properties of the samples for quality acceptance testing, if invoked by the Contractor. The samples shall be protected from freezing, heat, pressure and agitation during the storage period and transportation process.

Duplicate sample shall be taken. The sample size for each sample shall be 3.8 L, or quantity as required by the specific testing. The containers shall be free from contamination, and shall not be submerged in solvent, nor wiped with a solvent saturated cloth.

Transferring samples from one container to another shall be avoided if possible.

If the sample appears to be inhomogeneous after reconditioning and mixing, or the sample was subjected to freeze-thaw cycling prior to receipt, the sample shall be discarded, and a new sample shall be taken for testing. The duplicate sample shall be used, or a new sample shall be taken.

1103.08.04 Testing

Samples may be tested by the Owner according to the tests listed in Tables 1 to 6.

Before performing the tests, the samples shall be conditioned and stirred thoroughly to a homogeneous mixture according to AASHTO T 59 to ensure that the emulsified asphalt is in its optimal state for determining its true properties.

1103.08.05 Acceptance

Failure of any sample to conform to any of the material requirements shall be cause for rejection of the material. Rejected materials shall be replaced at no additional cost to the Owner.

**TABLE 1
Anionic Emulsified Asphalts**

Requirements	Type	Rapid Setting						Medium Setting				Slow Setting								Test Method
	Grade	RS-1		RS-2		RS-1hh		MS-1		MS-2		SS-1		SS-1h		SS-1hh		Straw Mulch Adhesive		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Emulsion																				
Viscosity, Saybolt Furol Seconds : at 25°C		20	100	--	--	20	60	20	60	--	--	20	60	20	60	20	60	17	40	ASTM D7496
at 50°C		--	--	75	300	--	--	--	--	35	400	--	--	--	--	--	--	--	--	
Residue by Distillation, % by Mass		55	--	60	--	55	--	55	--	65	--	55	--	55	--	55	--	55	--	ASTM D6997
Oil Portion of Distillate, % by Volume/Mass		--	--	--	--	--	1	--	--	--	10	--	--	--	--	--	1	--	--	ASTM D6997
Settlement, %, 5 Days		--	3	--	3	--	5	--	3	--	3	--	5	--	5	--	5	--	--	LS-221
7 Days		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5	
Demulsibility, % 35 ml, 0.02 N CaCl ₂		60	--	60	--	60	--	--	--	--	--	--	--	--	--	--	--	--	--	LS-220
50 ml, 0.1 N CaCl ₂		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.0	
VOC Content as determined by Oil Portion of Distillate, % by Volume (Note 1)		--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3	ASTM D6997

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TABLE 1
Anionic Emulsified Asphalts

Requirements	Type	Rapid Setting						Medium Setting				Slow Setting								Test Method
	Grade	RS-1		RS-2		RS-1hh		MS-1		MS-2		SS-1		SS-1h		SS-1hh		Straw Mulch Adhesive		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Emulsion																				
Sieve Text, % by Mass	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	ASTM D6933	
Cement Mixing Test, % by Mass	--	--	--	--	--	--	--	--	--	--	--	2.0	--	2.0	--	--	--	--	ASTM D6935	
Particle Charge	NEGATIVE OR NEUTRAL																		LS-218	
Coating Ability and Water Resistance, %, (Note 2)	--	--	--	--	--	--	80	--	80	--	--	--	--	--	--	--	--	--	LS-224	
Fire Resistance	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	PASS	Note 2	
Tests on Residue																				
Penetration (at 25°C, 100 g, 5 s), 0.1 mm	100	200	100	200	20	55	100	200	100	250	100	200	40	100	20	55	100	200	ASTM D5/D5M	
Ductility (at 25°C, 5 cm/min), cm	60	--	60	--	40	--	40	--	40	--	40	--	40	--	40	--	40	--	ASTM D113	

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**TABLE 1
Anionic Emulsified Asphalts**

Requirements	Type	Rapid Setting						Medium Setting				Slow Setting								Test Method
	Grade	RS-1		RS-2		RS-1hh		MS-1		MS-2		SS-1		SS-1h		SS-1hh		Straw Mulch Adhesive		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Residue																				
Ash Content, % by Mass of Residue		--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	ASTM D8078
<p>Notes:</p> <ol style="list-style-type: none"> 1. Apply to emulsified asphalt used in paving material or in paving, construction, and maintenance operations during the ozone season according to 'Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from the Use of Cutback and Emulsified Asphalt' with distillation temperature to 260°C. 2. This requirement does not apply for tack coat or joint painting emulsified asphalts. 3. There shall be no flash or flare-up when the flame of a Bunsen burner is held in contact with the surface of the material, as received, for a period of 10 seconds. 																				

**TABLE 2
Cationic Emulsified Asphalts**

Requirements	Type	Rapid Setting						Medium Setting				Slow Setting						Slurry Seal		Test Method
	Grade	CRS-1		CRS-2		CRS-1hh		CMS-2		CMS-2h		CSS-1		CSS-1h		CSS-1hh		CQS-1h		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Emulsion																				
Viscosity, Saybolt Furol Seconds :																				
at 25°C	--	--	--	--	20	60	--	--	--	--	20	100	20	100	20	60	20	100		ASTM D7496
at 50°C	50	150	100	400	--	--	50	400	50	400	--	--	--	--	--	--	--	--		
Residue by Distillation, % by Mass	62	--	67	--	55	--	65	--	65	--	57	--	57	--	55	--	60	--		ASTM D6997
Oil Portion of Distillate, % by Volume/Mass	--	3	--	3	--	1	--	10	--	10	--	5	--	5	--	1	--	--		ASTM D6997
Settlement, %, 5 Days	--	5	--	5	--	5	--	5	--	5	--	5	--	5	--	5	--	5		LS-221
Demulsibility, % 35 ml 0.8% Dioctyl Sodium Sulfosuccinate Solution	40	--	40	--	40	--	--	--	--	--	--	--	--	--	--	--	--	--		LS-220

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**TABLE 2
Cationic Emulsified Asphalts**

Requirements	Type	Rapid Setting						Medium Setting				Slow Setting						Slurry Seal		Test Method	
	Grade	CRS-1		CRS-2		CRS-1hh		CMS-2		CMS-2h		CSS-1		CSS-1h		CSS-1hh		CQS-1h			
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
Tests on Emulsion																					
VOC Content as determined by Oil Portion of Distillate, % by Volume (Note 1)	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3	ASTM D6997
Sieve Text, % by Mass	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	--	0.1	ASTM D6933
Cement Mixing Test, % by Mass	--	--	--	--	--	--	--	--	--	--	--	2.0	--	2.0	--	--	--	--	--	--	ASTM D6935
Particle Charge	POSITIVE																			LS-218	
Coating Ability and Water Resistance, % (Note 1)	--	--	--	--	--	--	80	--	80	--	--	--	--	--	--	--	--	--	--	--	LS-224
Tests on Residue																					
Penetration (at 25°C, 100 g, 5 s), 0.1 mm	100	250	100	250	20	55	100	250	40	125	100	250	40	125	20	55	40	125			ASTM D5/D5M

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**TABLE 2
Cationic Emulsified Asphalts**

Requirements	Type	Rapid Setting						Medium Setting				Slow Setting						Slurry Seal		Test Method
	Grade	CRS-1		CRS-2		CRS-1hh		CMS-2		CMS-2h		CSS-1		CSS-1h		CSS-1hh		CQS-1h		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Residue																				
Ductility (at 25°C, 5 cm/min), cm		60	--	60	--	40	--	60	--	40	--	60	--	40	--	40	--	40	--	ASTM D113
Ash Content, % by Mass of Residue		--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	ASTM D8078
Notes: 1. Apply to emulsified asphalt used in paving material or in paving, construction, and maintenance operations during the ozone season according to Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from the Use of Cutback and Emulsified Asphalt' with distillation temperature of 260°C. 2. This requirement does not apply for tack coat or joint painting emulsified asphalts.																				

**TABLE 3
High Float Emulsified Asphalts**

Requirements	Type	High Float														Test Method
	Grade	HFRS-2		HFMS-2 (ON)		HF-100S		HF-150S		HF-250S		HF-150M		HF-1000M		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Emulsion																
Viscosity, Saybolt Furol Seconds at 50°C	75	400	50	300	35	150	35	150	35	150	50	--	50	--	ASTM D7496	
Residue by Distillation, % by Mass	63	--	62	--	62	--	62	--	62	--	62	--	65	--	LS-226	
Oil Portion of Distillate, % by Volume/Mass	--	--	0.5	3	0.5	4	0.5	4	1	6	1	6	1	7	LS-226	
Demulsibility, % 35 ml 0.02 N CaCl ₂ 50 ml 0.10 N CaCl ₂ 50 ml 0.02 N CaCl ₂	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	--	--	--	--	75	--	75	--	--	--	--	--	--	--	LS-220	
	--	--	40	--	--	--	--	--	--	--	--	--	--	--	LS-220	
VOC Content as determined by Oil Portion of Distillate, % by Volume (Note 1)	--	3	--	3	--	3	--	3	--	3	--	3	--	3	ASTM D6997	
Oil Portion of Distillate, % by Volume/Mass	--	--	0.5	3	0.5	4	0.5	4	1	6	1	6	1	7	LS-226	
Sieve Text, % by Mass	--	0.10	--	0.10	--	0.10	--	0.10	--	0.10	--	0.10	--	0.10	ASTM D6933	
Particle Charge	--	--	Negative		--	--	--	--	--	--	--	--	--	--	LS-218	
Coating Ability and Water Resistance, %	--	--	90	--	90	--	90	--	90	--	90	--	90	--	LS-224	
Storage Stability 24 h, % by Mass	--	1.0	--	1.5	--	1.5	--	1.5	--	1.5	--	1.5	--	1.5	LS-221	
Tests on Residue																
Penetration (at 25°C, 100 g, 5 s), 0.1 mm	100	200	90	200	100	175	150	250	250	500	150	--	--	--	LS-226	

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**TABLE 3
High Float Emulsified Asphalts**

Requirements	Type	High Float														Test Method
	Grade	HFRS-2		HFMS-2 (ON)		HF-100S		HF-150S		HF-250S		HF-150M		HF-1000M		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Residue																
Ductility (at 25°CMA , 5 cm/min), cm	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ASTM D113
Ash Content, % by Mass of Residue	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	--	ASTM D8078
Float Test at 60°C, s	1200	--	1200	--	1200	--	1200	--	1200	--	1200	--	1200	--	1200	LS-226
Apparent Viscosity (at 60°C), Pa·s	--	--	--	--	250	--	90	--	20	--	10	80	2	8	LS-226	
Notes: 1. Apply to emulsified asphalt used in paving material or in paving, construction, and maintenance operations during the ozone season according to 'Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from the. Use of Cutback and Emulsified Asphalt' with distillation temperature to 260°C.																

TABLE 4
Polymer-Modified Emulsified Asphalts

Requirements	Type	Anionic				Cationic								High Float								Test Method
	Grade	RS-1P		RS-2P		CRS-1P		CRS-2P		CQS-1hP		CSS-1P		HFMS-2P(ON)		HF-100SP		HF-150SP		HF-150MP		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Emulsion																						
Viscosity, Saybolt Furol Seconds: at 25°C at 50°C	20	100	--	--	--	--	--	--	--	20	100	20	100	--	--	--	--	--	--	--	ASTM D7496	
Residue by Distillation to 204.4 °C, % by Mass	55	--	60	--	62	--	65	--	62	--	62		62	--	62	--	62	--	62	--	ASTM D6997 LS-226	
Oil Portion of Distillate, % by Volume/Mass	--	--	--	--	--	--	--	--	--	--		5	0.5	3	0.5	4	0.5	4	1	6	LS-226	
Storage Stability , 24 h, % by Mass	--	1	--	1	--	1	--	1	--	1		1	--	1.5	--	1.5	--	1.5	--	1.5	LS-221	
Demulsibility, % 35 ml, 0.02 N CaCl ₂ 35 ml, 0.8% Dioctyl Sodium Sulfo-Succinate Solution 50 ml 0.10 N CaCl ₂ 50 ml 0.02 N CaCl ₂	60	--	60	--	--	--	--	--	--	--			--	--	--	--	--	--	--	--	LS-220	
VOC Content as determined by Oil Portion of Distillate, % by Volume (Note 1)	--	3	--	3	--	3	--	3	--	3		3	--	3	--	3	--	3	--	3	ASTM D6997	

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TABLE 4
Polymer-Modified Emulsified Asphalts

Requirements	Type	Anionic				Cationic								High Float								Test Method			
	Grade	RS-1P		RS-2P		CRS-1P		CRS-2P		CQS-1hP		CSS-1P		HFMS-2P(ON)		HF-100SP		HF-150SP		HF-150MP					
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		Min.	Max.	
Tests on Emulsion																									
Sieve Text, % by Mass	--	0.20	--	0.20	--	0.20	--	0.20	--	0.10		0.1	--	0.10	--	0.10	--	0.10	--	0.10	--	0.10	ASTM D6933		
Particle Charge	Negative or Neutral				Positive								Negative		--		--		--		--		LS-218		
Coating Ability and Water Resistance Test	--		--		--		--		--				90		--		90		--		90		--		LS-224
Tests on Residue																									
Penetration (at 25°C, 100 g, 5 s), 0.1 mm	100	200	100	200	100	250	100	250	40	90	100	250	90	200	90	150	150	250	150	250	150	250	ASTM D5/D5M LS-226		
Float Test at 60°C, s	--	--	--	--	--	--	--	--	--	--			1200	--	1200	--	1200	--	1200	--	1200	--	LS-226		
Ash Content, % by Mass of Residue	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0		10	--	1.0	--	1.0	--	1.0	--	1.0	--	1.0	ASTM D8078		
Elastic Recovery (at 10°C), % (Note 2)	55	--	55	--	55	--	55	--	50	--	55		55	--	55	--	50	--	50	--	50	--	LS-208		
Force Ductility at 800% Elongation, 5 cm/min. Pull Rate at 4°C, kg	0.5	--	0.5	--	0.5	--	0.5	--	--	--			0.5	--	0.5	--	--	--	--	--	--	--	AASHTO T 300		

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TABLE 4
Polymer-Modified Emulsified Asphalts

Requirements	Type	Anionic				Cationic								High Float								Test Method
	Grade	RS-1P		RS-2P		CRS-1P		CRS-2P		CQS-1hP		CSS-1P		HFMS-2P(ON)		HF-100SP		HF-150SP		HF-150MP		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Tests on Residue																						
Softening Point, R&B, °C	--	--	--	--	--	--	--	--	--	57	--			--	--	--	--	--	--	--	ASTM D36	
<p>Notes for Table 4:</p> <ol style="list-style-type: none"> 1. Apply to emulsified asphalt used in paving material or in paving, construction, and maintenance operations during the ozone season according to 'Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from the Use of Cutback and Emulsified Asphalt' with distillation temperature to 204°C for polymer-modified emulsified asphalts. 2. Testing Procedure B of LS-208M to be used for elongation of 20 ± 0.25 cm. 																						

**TABLE 5
Emulsified Asphalt Primer (EAP)**

Requirements	Min.	Max.	Test Method
Viscosity, Saybolt Furol Seconds at 50°C	35	150	ASTM D7496
Residue by Distillation to 260°C, % by Mass	40	--	LS-217
Oil Portion of Distillate, % by Volume/Mass	10	30	LS-217
VOC Content as determined by Oil Portion of Distillate, % by Volume (Note 2)	--	3	ASTM D6997
Particle Charge	Neutral		LS-218
Flash Point, Tag Open Cup, °C	45	--	ASTM D1310
Storage Stability, 24 h	No visible separation		LS-221 (Note 2)
Tests on Residue			
Penetration (at 25°C, 100 g, 5 s), 0.1 mm	100	300	ASTM D5/D5M
Ductility (at 25°C, 5 cm/min), cm	100	--	ASTM D113
Ash Content, % by Mass of Residue	--	1.0	ASTM D8078
<p>Notes:</p> <ol style="list-style-type: none"> 1. Apply to emulsified asphalt used in paving material or in paving, construction, and maintenance operations during the ozone season according to 'Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from the Use of Cutback and Emulsified Asphalt' with distillation temperature to 204°C for polymer-modified emulsified asphalts. 2. Follow ASTM D6930 to obtain the percentage of residue from the top samples and bottom samples, and the testing results will be for information purposes only. The compliance of storage stability shall be based on any visual separation of 500 mL representative sample in the glass cylinder after 24 hours. 			

**TABLE 6
Solvent-Free Emulsified Asphalt**

Requirements	Min.	Max.	Test Method
Viscosity, Saybolt Furol Seconds at 25°C	5	50	ASTM D7496
Residue by Distillation to 260°C, % by Mass	40	-	LS-217
Oil Portion of Distillate, % by Volume/Mass	-	0.5	LS-217
Sieve Test, % by Mass	-	0.1	ASTM D6933
Storage Stability, 24 h, %	No visible separation		LS-221 (Note 1)
Particle Charge	Negative or Neutral		LS-218
Tests on Residue			
Penetration (at 25°C, 100 g, 5 s), 0.1 mm	40	150	ASTM D5/D5M
Ductility (at 25°C, 5 cm/min), cm	40	--	ASTM D113
Ash Content, % by Mass of Residue	--	1.0	ASTM D8078
Notes:			
1. Follow ASTM D6930 to obtain the percentage of residue from the top samples and bottom samples, and the testing results will be for information purposes only. The compliance of storage stability shall be based on any visual separation of 500 ml representative sample in the glass cylinder after 24 hours.			

TABLE 7
Temperature for Spraying and Mixing Emulsified Asphalts, °C

Grade	Spraying		Mixing	
	Minimum	Maximum	Minimum	Maximum
RS-1, RS-1P, RS-1hh	30 (Note 1) 20 (Note 2)	70 70	-- --	-- --
RS-2, RS-2P	60 (Note 1)	80	--	--
MS-1	--	--	30	70
MS-2	--	--	30	70
SS-1	20	70	20	70
SS-1h, SS-1hh	20	70	20	70
HFRS-2	60	80	--	--
HFMS-2(ON), HFMS-2P(ON)	60	80	--	--
HF-100S, HF-100SP	60	80	--	--
HF-150S, HF-150SP	60	80	--	--
HF-250S	60	80	--	--
HF-150M, HF-150MP	--	--	40	80
HF-1000M	--	--	40	75
CRS-1, CRS-1P, CRS-1hh	60	80	--	--
CRS-2, CRS-2P	60	80	--	--
CMS-2	--	--	30	70
CMS-2h	--	--	30	70
CSS-1	--	--	30	70
CSS-1h	--	--	30	70
CSS-1hh	20	70	--	--
CSS-1h (Slurry)	--	--	20	35
CQS-1hP	--	--	Manufacturer's Requirements	
Emulsified Asphalt Primer (EAP)	Manufacturer's Requirements		--	--
Solvent-Free Emulsified Asphalt	Manufacturer's Requirements		--	--
Notes: 1. For surface treatment. 2. For other uses.				

**Appendix 1103-A, November 2025
FOR USE WHILE DESIGNING MUNICIPAL CONTRACTS**

Note: This is a non-mandatory Commentary Appendix intended to provide information to a designer, during the design stage of a contract, on the use of the OPS specification in a municipal contract. This appendix does not form part of the standard specification. Actions and considerations discussed in this appendix are for information purposes only and do not supersede an Owner's design decisions and methodology.

Designer Action/Considerations

The designer should specify the following in the Contract Documents:

- Specify the type and grade of the emulsified asphalt. (1103.05.01)
- Representative samples of material. (1103.08.03)
- For polymer modified emulsion, the containers for samples shall be new clean plastic wide-mouth jars or bottles with tight screw caps. The caps and the containers shall fit together tightly. (1103.08.03)

Related Ontario Provincial Standard Drawings

No information provided here.