



Specifications For Manufactured Materials

Section: EMULSIFIED ASPHALT

Subject: HIGH FLOAT RAPID SETTING
SEALING GRADES

1. PRODUCT DESCRIPTION

1.1. Description

The specification for high float rapid setting sealing grade (HFRSSG) emulsified asphalt applies to liquid asphaltic materials in the form of homogeneous aqueous emulsions of the anionic type. HFRSSG emulsified asphalt is specified by the grade HFRS2.

1.2. Composition/Characteristics

HFRSSG emulsified asphalt shall consist of asphalt cements dispersed in an aqueous phase and may contain a light petroleum distillate. The residual bitumen has non-Newtonian flow characteristics and exhibits resistance to flow regardless of penetration of the residual bitumen.

1.3. Application/Use

The HFRSSG emulsified asphalt described herein shall be suitable for seal coating with 9 and 12.5 screened chip aggregates.

1.4. Method of Production

Emulsified asphalt is a dispersion of asphalt cement suspended in water effected through the use of mechanical energy, thermal energy and the use of emulsifiers to maintain the dispersion.

If the supplier elects to incorporate non traditional material components such as crude oil, waste products or by products of other industrial and manufacturing processes in the HFRSSG emulsified asphalt, the Province must be advised in writing before any material is supplied.

1.5. Definitions

Asphalt Cement: A dark brown to black solid or semi-solid cementitious material which gradually liquifies when heated. One type of bitumen that is obtained as residue in refining crude oil.

Bitumen: Any mixture of hydrocarbons of natural or pyrogenous origin or both which is completely soluble in carbon disulphide.

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Emulsified Asphalt: A mixture of asphalt cement with or without petroleum solvent and water containing an emulsifying agent, which maintains the asphalt cement globules in suspension. The water is the continuous phase and the asphalt cement globules are the discontinuous phase.

Residual Bitumen: The residual material which remains after the distillation of an emulsified asphalt as described by the test methods referenced in this specification.

2. PRODUCT SPECIFICATION

2.1. General Requirements

2.1.1. Uniformity

The HFRSSG emulsified asphalt described herein shall be free of contamination and shall be homogeneous and uniform in character throughout.

2.1.2. Delivery

The specified material shall be delivered in accordance with SHT SMM 104 - General Provisions for Asphalt Supply Contracts.

2.1.3. Prequalification Samples

First time suppliers of products described in the specification are referred to the item 3 of the Terms and Conditions of Tender.

2.2. Material Characteristics and Properties

TABLE 1
Requirements of High Float Rapid Setting Sealing Grade Emulsified Asphalt

GRADE PROPERTY	HFRS2		TEST METHOD (Note 1)
	Min	Max	
Residue by Distillation, (% by mass)	62	-*	CAN2-16.5-M84 Par. 6.2.1
Oil Portion of Distillate, (% by volume)	0.5	4.0	ASTM D244 CAN2-16.5-M84 Par. 6.2.1.3
Viscosity (SF) @50° C, (s)	50	200	ASTM D244
Sieve Test, Retained on 1000 um sieve, (% by mass)	-	0.10	CAN2-16.5-M84 Par. 6.2.2
Storage Stability Test, 24 h, (% by mass)	-	1.5	ASTM D244
Demulsibility, 35 ml, 1.11 g/L, CaCl ₂ , (% by mass)	50	-	ASTM D244
<u>Tests on Residue</u>			
Penetration @ 25° C, 100g, 5 s (0.1 mm)	90	200	CAN2-16.5-M84 Par. 6.2.4
Apparent Viscosity at 60° C, (Pa.s)	Requirements outlined on the chart beneath Figure 1		CAN2-16.5-M84 Par. 6.2.5
Float Test @ 60°C, (s)	1200	-	CAN2-16.5-M84 Par. 6.2.6
Solubility in Trichlorethylene (% by weight)	97.5	-	ASTM D244

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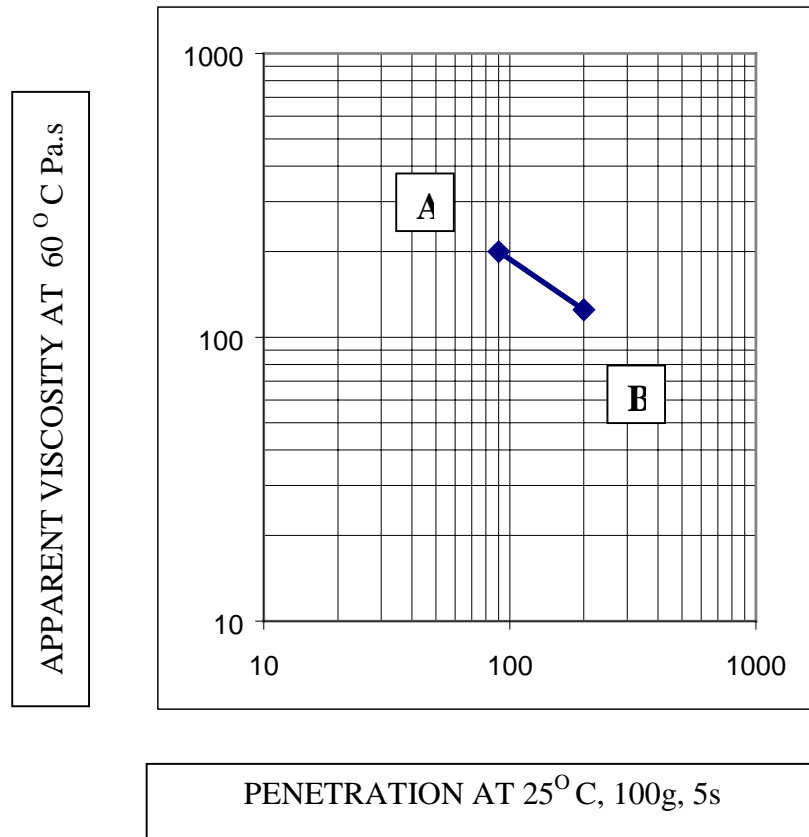
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Figure 1. Viscosity Requirements for Distillation Residues from HFRSSG Emulsified Asphalts

A (90, 200)

B (200, 125)



Viscosity shall be within the graphic regions above the line designated by specified letters, and between penetration limits contained in vertical lines extending upwards from those points.

Viscosity value shall be reported at 0.5s⁻¹ for HFSR2.

Grade of HFRSSG Emulsified Asphalt: HFRS2

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NOTE 1: Reference to ASTM Test Procedures shall be from the most recently approved version of the test procedure available at the time of supply contract award.

* Upper limit on % residue is governed by the viscosity limits

3. QUALITY ASSURANCE

3.1. Samples

Samples will be in accordance with STP 102 - Sampling Asphalt Materials.

3.2. Testing

3.2.1. **Sample Preparation**

Sample preparation for all HFRSSG emulsified asphalts shall be in accordance with ASTM D244 - Standard Test Methods for Emulsified Asphalts, with the following qualifications:

- a) Once the sample has reached the specified temperature of $50 \pm 3^{\circ}$ C, it shall be removed from the heat source within 24 hours, mixed and individual test samples poured; and
- b) Mixing shall be by hand stirring until the sample is homogenous in character, taking care to ensure that air is not being entrained into the emulsion during mixing.

3.2.2. **Pay Reduction Tests**

The Province has the option to do any one or more of the tests listed in Table 1 on any of the samples obtained by it. Pay reductions will be based on results of the tests performed.

If a test result is found to fall outside of the specification limits, a second test will be done on another portion of the same sample and the results averaged to assess the pay adjustment.

Should the duplicate test results differ by more than the tolerances for repeatability stated in 3.2.4 of this specification, then the average of the two test values shall not be used and instead the test result numerically nearest the specification limit shall govern.

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3.2.3. Time Limits

Loads on which no tests are performed or where tests have not been made within four weeks of the sampling date, will be accepted without pay adjustment.

3.2.4. Interpretation of Results

The criteria for judging the acceptability of test results for each property specified herein shall be the tolerances for repeatability specified in the most recent ASTM Standard Test Method for that property. For the following properties, testing within a lab or between two labs shall meet the following requirements.

Repeatability

Unit of Property	Within a Lab Measure	Range of (same operator)	Measurement
Oil Portion of Distillate	% by volume	0.5	0.0 - 7.0
Penetration on Residue (25° C, 100 g, 5 s)	0.1 mm	15	80 - 200
		35	200 - 500

3.3. Acceptance and Rejection

Pay reductions on HFRSSG emulsified asphalt which do not meet specification will be calculated as outlined in the attached form - FORM FOR DETERMINING THE PAY REDUCTION ADJUSTMENT FOR HFRSSG EMULSIFIED ASPHALT THAT DOES NOT MEET SPECIFICATION.

4. MEASUREMENT

Measurement of HFRSSG emulsified asphalt will be in accordance with SMM104 - General Provisions for Asphalt Supply Contracts.

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5. DELIVERY

Delivery of HFRSSG emulsified asphalt will be in accordance with the Terms and Conditions of Tender and SMM104 - General Provisions for Asphalt Supply Contracts.

6. PAYMENT

Payment for HFRSSG emulsified asphalt will be in accordance with the Terms and Conditions of Tender and SMM104 - General Provisions for Asphalt Supply Contracts.

FORM FOR DETERMINING THE PAY REDUCTION FOR HFRSSG EMULSIFIED ASPHALT THAT DOES NOT MEET SPECIFICATION

MANUFACTURER: _____

LAB ADMITTANCE NO.: _____

PRODUCT TYPE: _____

CONTROL SECTION: _____

DELIVERY SLIP NO: _____

SHT CONTRACT NO: _____

DATE SAMPLED: _____

MAINTENANCE TANK LOCATION: _____

DATE TESTED: _____

RES. ENG/AMS: _____

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SPECIFICATION	LIMITS		NO. OF UNITS		NO. OF MULTIPLIER	POINTS
	MIN	MAX	TEST RESULTS	OUTSIDE SPEC LIMITS		
ADJUSTMENT TEST						
Residue by Distillation (% by mass)	_____	_____	_____	_____	110	_____
Oil Portion of Distillation (% by volume)	_____	_____	_____	_____	200	_____
Viscosity (SF) @ 50° C, (s)	_____	_____	_____	_____	(Note 1)	_____
Sieve Test, Retained on 1000 um Sieve (% by mass)	_____	_____	_____	_____	400	_____
Coating Test (%)	_____	_____	_____	_____	15	_____
Storage Stability Test, 24 h (% by mass)	_____	_____	_____	_____	75	_____
Demulsibility, 50 ml, 5.55 g/l, CaCl ₂ , (% by mass)	_____	_____	_____	_____	30	_____
Penetration @ 25° C, 100 g, 5 s (0.1 mm)	_____	_____	_____	_____	9	_____
Apparant Viscosity @ 60° C, (Pa.s)	_____	_____	_____	_____	5	_____
Float Test @ 60° C, (s)	_____	_____	_____	_____	1.5	_____
Solubility in Trichlorethylene (% by weight)	_____	_____	_____	_____	65	_____
TOTAL ADJUSTMENT POINTS						_____

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Note 1: If test result < minimum Specified Value, Multiplier Factor is 35

If test result > maximum Specified Value, Multiplier Factor is 10

$$\text{PAY ADJUSTMENT} = \frac{\text{Total Adjustment Points}}{\text{POINTS}}^{2.3} = \frac{\quad}{100}^{2.3} = \frac{\quad}{100}$$

If Pay Adjustment Points \leq 2, Pay Factor is 1

If Pay Adjustment Points > 2, Pay Factor is $1 - \frac{\text{Pay Adjustment Points}}{100}$

Payment = (Price/Kilogram) (Total Weight)(Pay Factor); Except that, if the calculated pay adjustment points exceed 2, the pay reduction will be \$200.00 or the calculated pay reduction, whichever is greater.

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APPROVAL SHEET

New Revision Date of Previous Document 92-01-21
Effective Date: 99-03-15

Description of Revision (Reason for Revision):

Inclusion of Figure 1 and update Lab Admittance No.

Review/Implementation Process:

Reviewed by the Testing Standards Engineer

Other Manuals/Policies Affected:

Nil

Follow Up/Training Required:

Nil

Comments/Concerns/Implications (Budget/Environment/Stakeholders):

Nil

Prepared and Recommended by Abdul Qayyum 99-03-15
Testing Standards Engineer Date

Recommended by: _____
Director, Testing Services Date

Recommended by: _____
Executive Director, Eng. Services Date

Approved by _____
Assistant Deputy Minister, Operations Date

Electronic File Update _____
Update Mail _____

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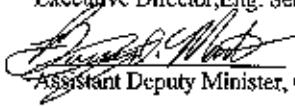
Nil

Follow Up/Training Required:

Nil

Comments/Concerns/Implications (Budget/Environment/Stakeholders):

Nil

Prepared and Recommended by	<u>Abdul Qayyum</u> Testing Standards Engineer	<u>99-03-15</u> Date
Recommended by:	 Director, Testing Services	<u>April 19, 1999</u> Date
Recommended by:	_____ Executive Director, Eng. Services	_____ Date
Approved by	 Assistant Deputy Minister, Operations	<u>1999-06-01</u> Date
	Electronic File Update Update Mail	<u>99-06-17</u> _____

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