

Idaho Standard Method of Test for Sampling and Viscosity Testing Emulsified Asphalt Binders in the Field

Idaho IT-61-08



1. Scope

- 1.1. This method covers field sampling and field testing of emulsified asphalt binders used for seal coats. Testing is performed using the Saybolt Furol Viscometer.

2. References

- 2.1. AASHTO T 40, Sampling Bituminous Materials
- 2.2. AASHTO T 72, Saybolt Viscosity.
- 2.3. AASHTO T 59, Testing Emulsified Asphalts (“Consistency” – “Viscosity”, Sections 34-38)

3. Apparatus

- 3.1. Saybolt Furol Viscometer with Bath, conforming to the requirements of AASHTO T 72 with an oil or water bath capable of maintaining the required testing temperature.
- 3.2. Receiving Flask- see figure# 1
- 3.3. Sieve – No. 20 (850 μm) sieve or a 20-mesh strainer of wire cloth framed or unframed.
- 3.4. Thermometers – ASTM No. 19 $^{\circ}\text{F}$ or 19 $^{\circ}\text{C}$ for tests at 122 $^{\circ}\text{F}$ (50 $^{\circ}\text{C}$) conforming to the requirements of ASTM No. E1.
- 3.5. Thief Sampling Device – Capable of obtaining a sample from mid-depth of tanker/ tank.
- 3.6. Timer – Capable of measuring to the nearest 0.1 second.
- 3.7. Sample Can - 1-quart (1 liter) small-mouth
- 3.8. Plastic Jar- 1-quart (1 liter) wide mouth.
- 3.9. Sample bottle -8 fl. oz. (265 mL) plastic dairy bottle
- 3.10. Sample bottle Stopper- with an opening to insert a dial thermometer through it and sized to fit the opening in the dairy bottle

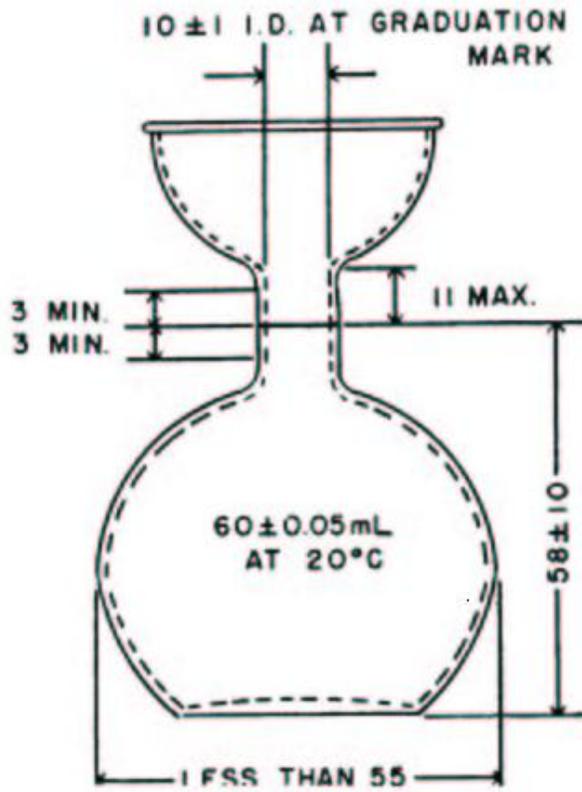


Figure #1: Receiving Flask

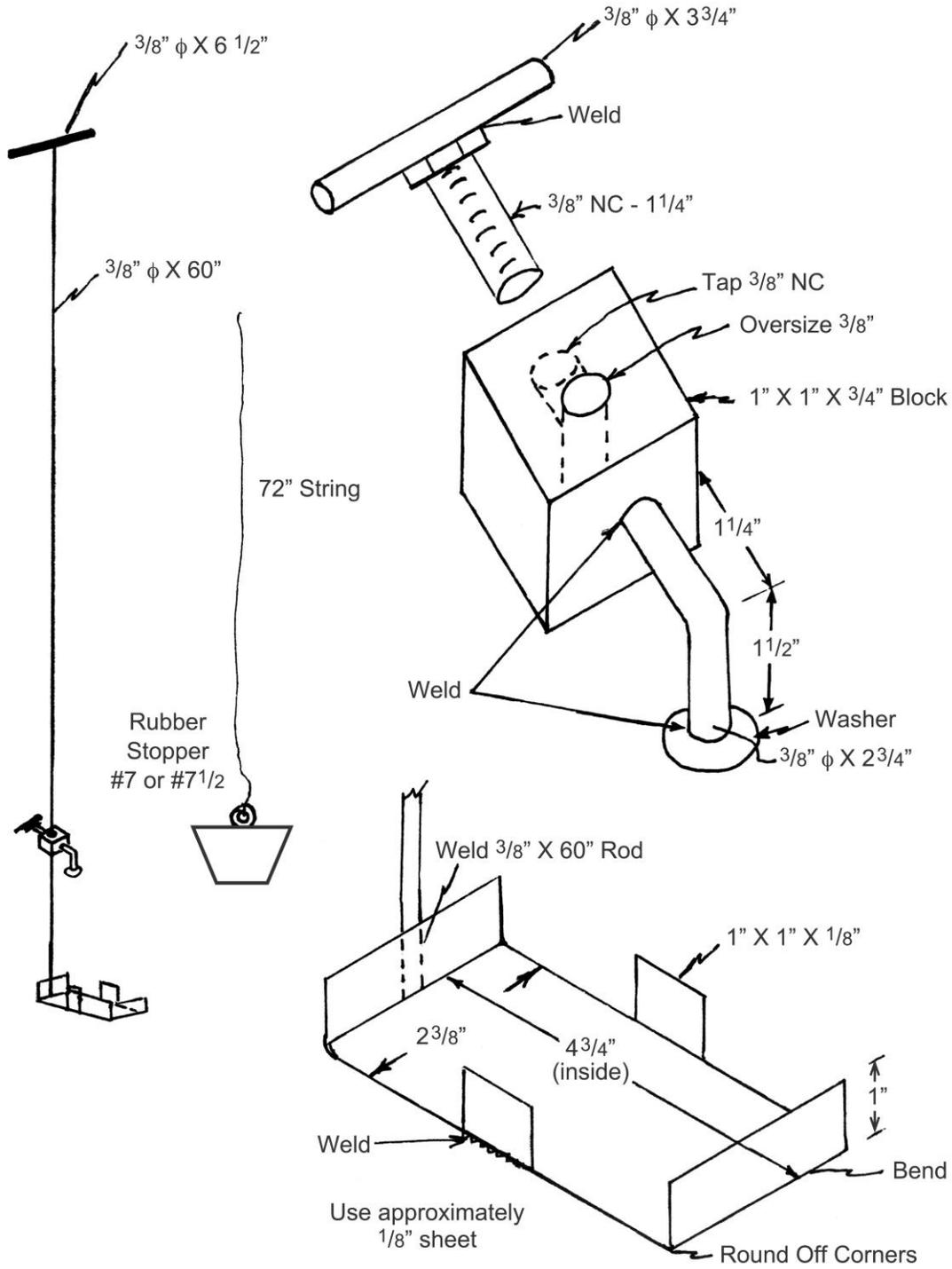


Figure #2: Thief Sampling Device (Dip method Device)

4. Sampling:

- 4.1. The emulsified asphalt binder sample may be obtained by either of two methods. These methods are covered in AASHTO T 40 but will also be covered here. They are; the “Valve method” and “Thief Method.” Samples shall be obtained before any material is unloaded.

Note#1: A safe means of sampling shall be provided by the contractor / supplier. With the “Thief method” proper fall protection must be provided.

- 4.1.1. Valve Method: A recommended design for the valve is shown in AASHTO T 40.
- 4.1.1.1. In order to clear the line, draw and discard 4 L (1 gal) of emulsified Asphalt using a valve located in the center of the tank.
 - 4.1.1.2. After clearing the line, immediately draw the emulsified Asphalt sample into a large mouthed 1 L (1 quart) plastic jar.
- 4.1.2. Thief Method (Dip Method): This method shall only be used when a truck tanker or distributor does not have a valve available to obtain the sample.
- 4.1.2.1. Attach the 1 L (1 quart) can at the bottom of the Thief device (see figure# 2). Stopper the can with a # 7 or #7 1/2 rubber stopper. The stopper shall have a way to remove it from the can once the can has been submerged on the thief device.

Note # 2: Before sampling, a careful observation of the material shall be made to detect the presence of foam or free water on top of the load. Care should be taken to immerse sampling device deep enough to pass through any foam or free water that may exist on top of material.

- 4.1.2.2. Lower the attached stoppered 1 L (1 quart) can to mid-depth of the tanker/ tank.
 - 4.1.2.3. Pull the stopper from the can. Allow the can to fill.
 - 4.1.2.4. Withdraw the Thief device along with the sample and sample can from the tanker/ tank.
- 4.2. Immediately transfer approximately 204 mL (6 to 7 oz.) of emulsified asphalt into a 265 mL (8 fl. oz) plastic dairy bottle. Seal the container securely to eliminate the chance of evaporation of water in the sample with a rubber stopper having a small dial thermometer through its center.

Note# 3: It is recommended that while the sample is cooling for testing clean the thief device and can stopper.

5. Testing

- 5.1. Preheat the Sabolt Furol Viscometer bath to testing temperature $50 \pm 0.05^{\circ}\text{C}$ ($122 \pm 0.09^{\circ}\text{F}$).
- 5.2. Insure that the brass viscometer tube is clean and dry and that the cork inserted into the bottom of the tube.

5.3. Cool the emulsified asphalt sample to $51.7 \pm 0.3^{\circ}\text{C}$ ($125 \pm 0.5^{\circ}\text{F}$).

Note# 3: The bottom of the sealed plastic bottle containing the emulsified asphalt sample may be immersed into a cold-water bath to cool it more quickly. Insure that thermometer is not touching the bottom of the bottle.

5.4. Once cooled, immediately pour the emulsified asphalt through a No. 20 (850 mm) sieve and into the brass viscometer tube until the sample is above the overflow rim.

5.5. Stir the emulsified asphalt sample in the brass viscometer tube at 60 RPM with a thermometer until it is at a temperature of $50^{\circ}\text{C} \pm 0.3^{\circ}\text{C}$ ($122^{\circ}\text{F} \pm 0.5^{\circ}\text{F}$). Avoid bubble formation while stirring. Once the test temperature is attained, withdraw the thermometer.

5.6. Place the tip of a suction pipette into the viscometer tube gallery. The gallery is the area where the overflow is contained. Quickly remove the excess emulsified asphalt from the gallery until the level in the gallery is below the overflow rim. Remove the pipette without touching the overflow rim.

5.7. Immediately cover the top of the viscometer tube.

5.8. Place the receiving flask in the proper position under the viscometer tube. Proper placement will insure that the sample will roll down the inside lip of the receiving flask.

5.9. Remove the cork from the viscometer tube and immediately start the timer.

5.10. Stop the timer when the emulsified asphalt meniscus bottom reaches the graduation mark.

5.11. Clean the viscometer tube, screen, cork, thermometer, and receiving flask.

5.12. If the initial tanker / tank sample fails to meet specified limits, a second sample will be obtained using the "Thief Method." When the test results on the second sample also fail to meet specifications the tanker / tank will be rejected.

6. Report

6.1. Record the results to the nearest 1 second.

6.2. Results shall be reported on an [ITD-1045](#), Sample Data Sheet Emulsified Asphalt and Cutbacks.

QUALIFICATION CHECKLIST FIELD VISCOSITY – IDAHO IT 61

Record the symbols “P” for passing or “F” for failing on each step of the checklist.

Procedure Element

Sampling

Trial 1 Trial 2

- | | | | |
|--|----|--|--|
| 1. Sample taken using a valve: | | | |
| a. Minimum of 4 L (1gal) allowed to flow before sample taken? | 1a | | |
| b. Sample taken in clean 1 L (1 quart) wide mouth jar? | 1b | | |
| 2. Sample taken with Thief device. | | | |
| a. Sample can immersed approximately to middle of tanker? | 2a | | |
| b. Rubber stopper removed from can and sample taken from the middle of the tanker / tank? | 2b | | |
| 3. A portion of the sample transferred to a one (1) half pint plastic bottle and sealed with a stopper having a thermometer in the center? | 3 | | |

Equipment

- | | | | |
|--|---|--|--|
| 4. Temperature of the viscometer bath at 50°C (122°F)? | | | |
| 5. Viscosity tube clean and dry and cork installed? | 5 | | |

Testing

- | | | | |
|--|----|--|--|
| 6. Sample cooled to 51.7 ±0.3°C (125 ±0.5°F)? | | | |
| 7. Sample poured through a #20 sieve prior to entering the brass viscosity tube? | 7 | | |
| 8. Enough sample poured into the tube to allow overflow into gallery? | 8 | | |
| 9. Thermometer placed into tube and sample stirred slowly until testing temperature reached? | 9 | | |
| 10. Thermometer withdrawn and excess in the overflow gallery siphoned out using a pipette without touching overflow rim? | 10 | | |
| 11. Emulsified asphalt sample in viscometer immediately covered? | 11 | | |
| 12. Cork pulled allowing the sample roll down the inside lip of the receiving flask? | 12 | | |
| 13. Timer immediately started when cork is pulled? | 13 | | |
| 14. Timer stopped when bottom of sample meniscus reaches graduation mark? | 14 | | |
| 15. Test results reported to nearest 1 second on ITD-1045 form? | | | |

First Attempt: Pass Fail Second Attempt: Pass Fail

Comments: _____

Participant Name _____ Exam Date _____ WAQTC# _____

Examiner’s Name: _____ Signature _____

WAQTC #: _____