

**ASPHALT IN-HOUSE CALIBRATION PROCEDURE # 13  
SAYBOLT FUROL VISCOSITY APPARATUS**

**EQUIPMENT CHECKED: SAYBOLT FUROL VISCOSITY APPARATUS  
(AASHTO T 59, T 72) (ASTM D 88, D 244)**

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**1. SCOPE**

- 1.1 This procedure provides instructions for calibrating a Saybolt fural orifice and calculating an orifice factor.
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**2. APPARATUS**

*Inspection Equipment Required:*

1. Timer, readable to 0:01 seconds
2. Cannon certified Viscosity Standard S 600 (min. efflux 90 sec.)
3. Graduated cylinder readable to 1.0 ml
4. Withdraw tube
5. Thermometer readable to 0.1°F
6. Receiving flask
7. Cork stopper
8. Thermometer support

*Tolerance:*

Equipment shall meet the tolerances specified in test methods AASHTO T 59, T 72, and ASTM D 244, D 88.

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**3. PROCEDURE**

- 3.1 Clean the viscometer thoroughly with an appropriate solvent of low toxicity; then remove all solvent from the viscometer and its gallery.
- 3.2 Clean the receiving flask in the same manner.
- 3.3 Place the receiving flask beneath the viscometer so that the graduation mark is 100 mm to 130 mm below the bottom of the viscometer tube, and that the stream of oil will just strike the neck of the flask.
- 3.4 Check that the fluid level in the bath is at least 6 mm above the overflow dm.
- 3.5 Observe and record the room temperature (20 - 30°C).
- 3.6 Insert a cork stopper into the air chamber at the bottom of the viscometer. The cork shall fit tightly to prevent the escape of air.
- 3.7 Preheat the calibration oil to not more than 1.7°C above the test temperature.

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- 3.8 Stir the sample well; then strain it through a No. 100 wire cloth directly into the viscometer chamber until the level is above the overflow rim.
- 3.9 Stir the sample in the viscometer with the appropriate thermometer and thermometer support. Using circular motions of 30 - 50 rpm, stir the sample continuously for one minute after the sample has stabilized to within .03 °C of the test temperature.
- 3.10 Using the withdraw tube, remove the excess oil from the gallery. Make certain the withdraw tube does not make contact with the head of the sample.
- 3.11 Check the position of the flask; then snap the cork from the viscometer and start the timer at the same instance.
- 3.12 Stop the timer the instance the bottom of the meniscus reaches the graduated mark on the receiving flask. Record the efflux time in seconds to the nearest 0.1 s.
- 3.13 If the efflux time observed differs from the certified value by more than .2 %, calculate a correction factor, F, for the viscometer as follows:

$$F = V / t (V) = \text{certified Saybolt viscosity of the standard, } (t) = \text{measured efflux time}$$

- 3.14 Viscometer or orifices requiring corrections greater than 1.0 % shall not be used in referee testing.