



**KINEMATIC VISCOSITY OF CUTBACK ASPHALT AT 140°F (60°C)
& ASPHALT BINDERS AT 275°F (135°C)**

SCOPE

This IM is intended to provide the procedure for determining the kinematic viscosity of cutback asphalt at 140°F (60°C) and asphalt binders at 275°F (135°C). This test method is identical to Iowa Test Method 609.

REFERENCED DOCUMENTS

AASHTO T-201 Kinematic Viscosity of Asphalts (Bitumens)

APPARATUS

- Viscometer. Zeitfuchs Cross-arm Viscometers, sizes No. 5, 6, 7 and 8 with certified calibrations.
- Thermometer, Bath and Timer – This apparatus is identical to that specified in AASHTO T-201.

PROCEDURE

Sample Preparation for Cutback Asphalt

1. Allow sealed samples, as received, to reach room temperature.
2. Open the sample container and mix the sample thoroughly by stirring, taking care to avoid the entrapment of air. Samples of MC-800 or MC-3000 may be warmed in the tightly sealed container in a bath or oven maintained at not more than 150°F (65°C) until they become sufficiently liquid for stirring.
3. Immediately pour approximately 20 ml into a clean, dry container having a capacity of approximately 30 ml and immediately seal with an airtight closure.
4. For samples of MC-800 or MC-3000, heat the 20 ml sample in the sealed container in a bath or oven maintained at no more than 150°F (65°C) until sufficiently liquid for convenient transfer into the viscometer. Such heating should not exceed 30 minutes.

Sample Preparation For Asphalt Binder

1. Remove the lid from the container and place the sample in an oven preheated to 265 to 285°F (129 to 141°C) until it becomes sufficiently fluid to pour. Stir the sample occasionally to assure uniformity.
2. Transfer a minimum of 20 ml into a suitable container and heat to 265 to 285°F (129 to 141°C), stirring occasionally to prevent local overheating and taking care to avoid entrapment of air.

TEST PROCEDURE

1. Maintain the bath within 0.05°F (0.03°C) of the test temperature. Apply the necessary corrections, if any, to all thermometer readings.
2. Select a clean, dry viscometer, which will give a flow time greater than 60 seconds.
3. Mount the viscometer in the constant temperature bath, keeping tube N vertical. Introduce sample through tube N, taking care not to wet the sides, into the cross-arm D until the leading edge stands within 0.5 mm of the fill mark G on the siphon tube.
4. Allow the viscometer to remain in the bath a sufficient time to ensure that the sample reaches temperature equilibrium. Not less than 20 minutes at 140°F (60°C), and 30 minutes at 275°F (135°C).
5. Apply slight vacuum to tube M (or pressure to tube N) to cause the meniscus to move over the siphon tube and about 1.5 in. (40 mm) below the level of tube D in capillary R; gravity flow is thus initiated.
6. Measure to the nearest 0.1 second the time required for the leading edge of the meniscus to pass from timing mark E to timing mark F. If this efflux time is less than 60 seconds, select a viscometer of smaller capillary diameter and repeat the operation.
7. Upon completion of the test, clean the viscometer thoroughly by several rinsings with a suitable residue-free solvent, followed by a rinsing with methyl alcohol. Dry the tube by passing a slow stream of dried air through the capillary for 2 minutes or until the last trace of solvent is removed. The instrument should be periodically cleaned with chromic acid to remove organic deposits.

CALCULATION

Calculate the kinematic viscosity to three significant figures using the following equation:

$$cSt = Ct$$

Where:

cSt = the kinematic viscosity in centistokes

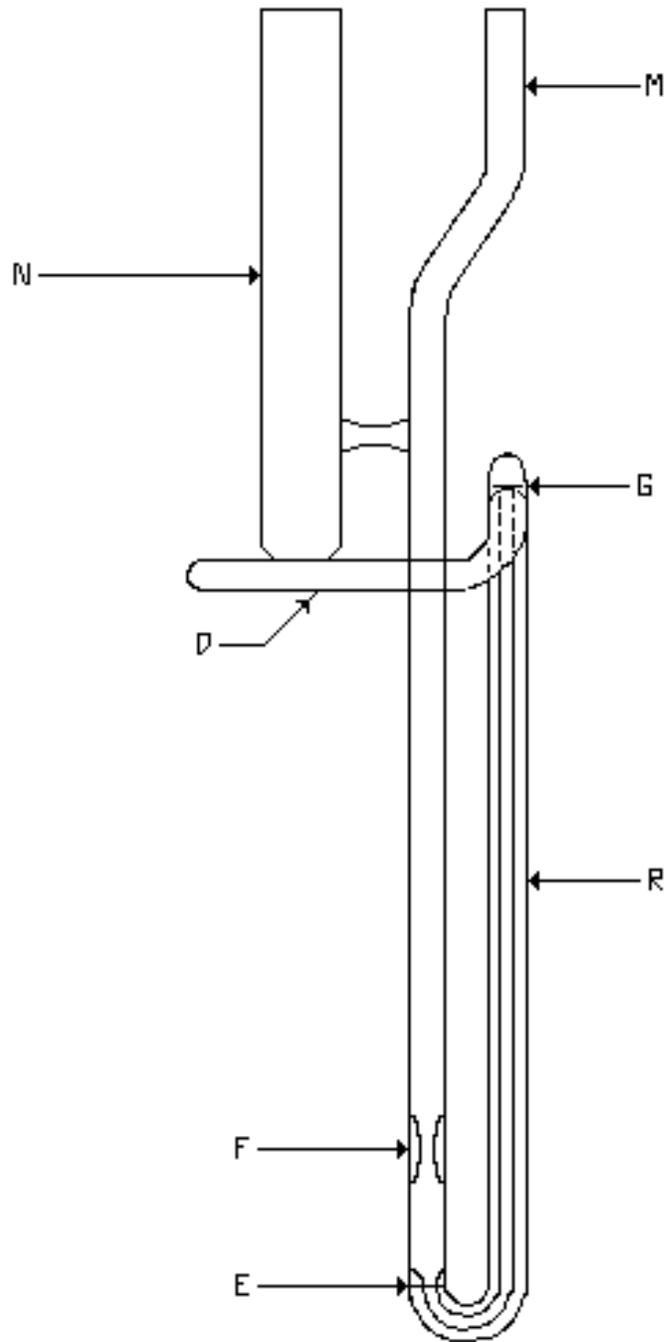
C = the calibration constant of the viscometer in the centistokes per second

t = the efflux time in seconds

REPORT

Always report the test temperature with the result for example:

Kinematic viscosity at 140°F (60°C) = 75.6 cSt.



Zeitfuchs Cross-Arm Viscometer