



Faulty of Engineering and Technology

Civil Engineering Department

Construction Materials Laboratory

ENCE215

Experiment :

" Asphalt test : Viscosity test of Bitumen "

Instructors :

Dr. Khalil Qatu

Eng. Nasser

Done by : Mohammad Al-Swaity " 1181136 "

Date of performing the experiment : 12/8/2020

Date of submitting the experiment : 21/8/2020

Introduction :

Viscosity is one of the fluid properties of bituminous materials and it is defined as a measure of the resistance of fluid to flow .

To calculate the actual percentage of bitumen in the mixture we must make a separation between aggregates and bitumen, and first we must disconnect the ponds in the mixture by adding the gasoline which react with it and destroyed the ponds between molecules then we put the bituminous mixture in the Centrifuge machine which make the wanted separation .

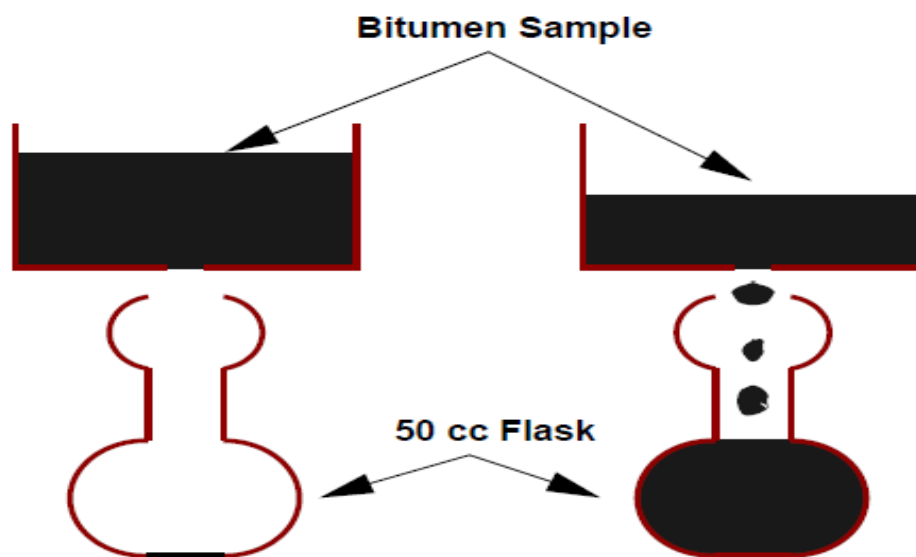
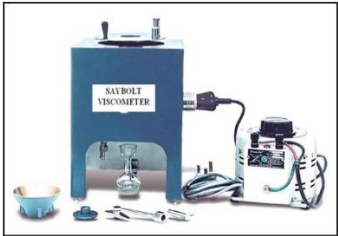




Figure (1)

Purpose :

To calculate the viscosity of the bitumen .

Materials and Equipment's :

Equipment	The name of it :	Equipment	The name of it :
 <p>Figure 1</p>	Test Machine	 <p>Figure 2</p>	Bottle
 <p>Figure 3</p>	Timer		

" Table 1 "

Procedure :

1. Establish and control the bath temperature to be as the test temperature (25 °C).
2. Insert a cork stopper into the air chamber at the bottom of the viscometer. Fit the cork tightly enough to prevent the escape of air so that no oil will be on the cork when it is withdrawn later.
3. If the test temperature is above the room temperature, then heat the sample to not more than 1.7 °C above test temperature.
4. Stir the sample well and then strain it through 150 µm wire cloth in the filter funnel directly into the viscometer until the level is above the overflow rim .
5. Stir the sample in the viscometer with the appropriate viscosity thermometer equipped thermometer support. When the temperature remains constant around the test temperature during 1 min of continuous stirring, remove the thermometer.
6. Check to be sure that the receiving flask is in the proper position, then snap the cork from the viscometer using attached chord and start the timer at the same instant.
7. Stop the time the instant the oil reaches the graduation mark on the receiving flask. Record the efflux time in seconds to the nearest 0.1 sec.

Data and Calculations :

Trial No.	Time needed to fill the flask (sec)
1	224

Sample Calculation :

$$v = C_1 t + \frac{C_2}{t}$$

$$C_1(\text{constant}) = 0.222 \text{ mm}^2/\text{sec}^2$$

$$C_2(\text{constant}) = - 182.528 \text{ mm}^2$$

$$v = 0.222 (224) + \frac{-182.528}{224} = 48.91 \text{ mm}^2/\text{sec}$$

Result and Conclusion :

The result obtained for this test was 48.91 mm²/sec.

The viscosity test measures the viscosity of asphalt. The viscosity test and the penetration test both measure the consistency of asphalt at some specified temperatures and are used to designate grades of asphalts. The advantage of using the viscosity test as compared with the penetration test is that the viscosity test measures a fundamental physical property rather than an empirical value.