STP 4.7 - Pour Point

Summary: The fluidity or ability of a product to flow at moderately low temperatures may be an important characteristic, especially for those areas where early season fires occur at higher elevations and lower temperatures.

FOAMS and WATER ENHANCERS

To determine fluidity, samples will be subjected to specific temperatures overnight and then tested to determine their ability to flow. *This method is no longer conducted in house but is contracted through an independent accredited laboratory.*

Water Enhancers and Foams must be pourable down to 35°F.

Equipment:

Beakers, 200-mL capacity, tall form
Stopper to fit the beakers with a single hole to hold the thermometer
Thermometers, readable from 0 °F to 100 °F
Water bath or incubator, to maintain temperatures of 40 °F, 33 °F, and 5 °F
Test sample

Method:

Following guidance of ASTM D-97[1], below is a method summary:

1. Starting with the highest temperature, adjust the temperature control of the water bath, or incubator to the required temperature, and allow the temperature to stabilize.
2. Maintain the test sample at 70 °F for 24 hours prior to testing.
3. Fit a thermometer into the stopper so that the thermometer will not touch the bottom of the beaker when the stopper/thermometer assembly is inserted into the beaker.
4. Pour 100 mL of test sample into each of 3 beakers.
5. Insert the stopper/thermometer assembly into each beaker, ensuring that the thermometer is immersed into the sample and that the tip of the thermometer is about 0.25 inches from the bottom and sides of the beaker.
6. Place the beaker with sample and thermometer assembly into water bath or incubator to maintain the test temperature.
7. Allow the samples to sit undisturbed for 24 hours.

8. Note the sample temperature for the test sample and tilt the container slightly, while watching for any movement or wrinkling of the surface of the sample.
    a. Slowly tilt the sample to 45 degrees or until movement is observed, whichever is less
    b. The entire tilt and observation period should take less than 5 seconds avoid changes in temperature during the observation.
    c. Use caution so as not to disturb any crystals or films that may be forming as this can give erroneously low results.
9. Rate the sample as fluid, semi solid, or solid based on its behavior when tilted. A fluid sample will pour easily. A semi solid sample will wrinkle or shift slightly when tilted. A solid sample will show no sign of wrinkling when tilted.
10. Repeat for each sample.
11. If any of the samples are fluid or semi solid, repeat the process with fresh product and the next lower temperature.

References:

[1]American Society for Testing and Materials. Standard Test Method for Pour Point of Petroleum Products; D97.