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FLASH AND FIRE POINTS OF TALL OIL

Definition

The flash point of tall oil is the lowest temperature at which it will flash and its fire point is the lowest temperature at which it will burn for at least 5 s, the tests in both cases carried out as specified in this method.

Scope

This method applies to crude and distilled tall oil, tall oil fatty acids and tall light oil.

Apparatus

The apparatus (Figure 1) consists of:

- 1. Thermometer with a range from -6°C to + 400°C and conforming to the requirements for thermometer 11 C, ASTM Designation E 1-63, (1).
- 2. Flash cup, made of brass and of dimensions and shape as shown in Figure 2.
- 3. Supporting plate, made of brass, cast or wrought iron, or steel, 6.4 mm thick and 152.5 mm in diameter (Figure 2). It has a plane depression in the centre, 0.8 mm deep and of large enough diameter just to take the cup. Centrally in the depression a hole 55 mm in diameter passes through the plate. The plate is covered with a sheet of hard asbestos board, 6.4 mm thick, with a hole to take the cup.
- 4. Electric hot plate with temperature control, or a gas burner. A flame should not be allowed to come up around the cup. This should be protected from drafts by a screen that does not project above the upper surface of the asbestos board. The heat source is centred under the aperture of the plate and there should be no risk of local superheating.
- 5. Test burner.

Preparation of sample

Mix the sample thoroughly. If it contains more than 1% of water dry it at a temperature of 80°C for 1 to 2 h, with occasional mixing.

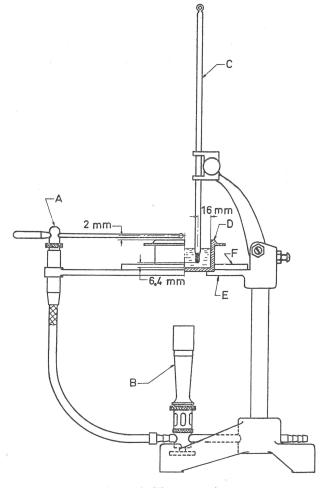
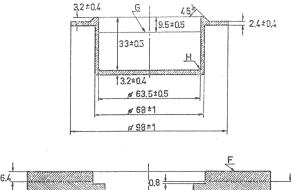


Figure 1. The apparatus.

- A. Test burner
- B. Heating device
- C. Thermometer
- D. Flash cup
- E. Supporting plate
- F. Asbestos board



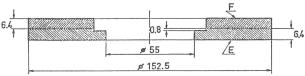


Figure 2. Flash cup and supporting plate.

E. Metal

F. Asbestos board

G. Filling mark

H. Fillet, 4.0 mm in radius

Procedure

Carry out the tests in a room free from drafts and darkened so that the flash is easily seen. Avoid breathing over the surface of the sample. Pour the sample into the cup until the top of the meniscus is exactly at the filling mark. Suspend or secure the thermometer vertically with the bulb ca. 6 mm above the bottom of the cup and half way between the centre and the back of the cup. Heat the sample at a maximum rate of 17°C per minute until ca. 60°C below the flash point, and then regulate the heating so that the temperature increases by 6°C per minute. By means of the test burner apply a test flame ca. 3 mm in diameter. When the temperature reaches each successive 3°C mark, pass the flame in a straight

line or in a circle at least 150 mm in radius, across the centre of the cup and at right angles to the diameter through the thermometer; during this action the path of the flame shall lie in the plane of the rim of the cup. The test flame shall be passed across the cup in ca. 1 s. Record the flash point as the temperature indicated by the thermometer when a flash appears at any point on the surface of the sample. Disregard any bluish halo that may surround the test flame.

Continue the heating as before until application of the test flame causes burning for at least 5 s. Record the temperature indicated by the thermometer as the fire point.

Report

Carry out two determinations and report the mean to the nearest whole number as the flash or fire point of the tall oil (Note 1).

Additional information

This method is based on ASTM Designation D 92—57 and AOCS Official Method Ka 7—55, and should give equivalent results.

Note 1

The duplicate determinations shall not differ by more than the following margins:

	Repeatability, same operator and apparatus	Reproducibility, different laboratories
Flash point	8°C	16°C
Fire point	5°C	11°C

Literature

- American Standard for Testing and Materials, 1966 Book of ASTM Standards, part 17, p. 31.
- American Oil Chemists' Society, AOCS Official Method Ka 7—55.

This method has been published in:

Norsk Skogindustri 21 (1967): 3, 105—108. (English and Norwegian).

Paperi ja Puu — Papper och Trä 49 (1967): 3, 122—125. (English and Finnish).

Paperi ja Puu - Papper och Trä 49 (1967): 4, 309-310. (Swedish).

Svensk Papperstidning 70 (1967): 6, 216—217. (Swedish).

Svensk Papperstidning 70 (1967): 7, 245—246. (English).