(b) *Description of apparatus*—(1) *Petri dish*. Standard laboratory Petri dishes, approximately 90 mm. by 16 mm., shall be used to contain the test samples.

(2) *Oven*. A gravity convection air oven, capable of maintaining the specified evaporation temperature constant within ±2 °F., shall be used in the test.

(3) *Pipe cleaner*. An ordinary smoker's pipe cleaner (U.S. Tobacco Co., Dill's or equivalent) shall be used in the test procedure, described in paragraph (c) of this section.

(c) *Test procedures*. (1) Three 30-milliliter samples of the fluid shall be placed in uncovered Petri dishes. Two of these samples shall be inserted in the oven, that shall have been heated to a temperature of 150 °F., ±2 °F., which shall be maintained throughout this test. The third sample shall remain at room temperature.

(2) An electrically operated cycling device, such as an automobile windshield wiper mechanism, shall be oscillated in a horizontal plane, 25 ±2 cycles per minute. A pipe cleaner shall be attached to the device so that it will enter and leave a flame of a standard (Bunsen or equivalent) laboratory burner, which is adjusted to provide a nonluminous flame approximately 4 inches in height without forming a sharp inner cone. The cycling device shall be so arranged that when a 2-inch length of pipe cleaner is attached thereto the exposed end shall describe an arc with a radius of 4 inches ±⅛ inch. The cycling device shall be so arranged that when the 2-inch length of pipe cleaner is attached thereto, its midpoint shall be in the center of the flame at one extreme end of the cycle.

(3) Each of five 2-inch lengths of pipe cleaner shall be soaked separately for a period of 2 minutes in the test sample that remained at room temperature. Each pipe cleaner shall then be removed from the test sample and permitted to drain freely until all excess fluid is expelled from it. Each soaked pipe cleaner shall be attached to the cycling device, the mechanism started, and the pipe cleaner permitted to enter and leave the burner flame, as described in paragraph (c) (2) of this section, until a self-sustaining flame shall be observed on the pipe cleaner. The number of cycles necessary to obtain a self-sustaining flame shall be noted and averaged for each of the five soaked pipe cleaners.

(4) After one test sample has remained in the oven for a period of 2 hours, the Petri dish containing it shall be removed from the oven and allowed to cool to room temperature, after which 5 lengths of 2-inch pipe cleaner shall be soaked separately in the test sample for a period of 2 minutes. Then the test procedure stated in paragraph (c) (3) of this section shall be repeated.

(5) After one test sample has remained in the oven for a period of 4 hours, the Petri dish containing it shall be removed from the oven and allowed to cool to room temperature, after which 5 lengths of 2-inch pipe cleaner shall be soaked separately in the test sample for a period of 2 minutes. Then the test procedure stated in paragraph (c) (3) of this section shall be repeated.

(d) *Appraisal of tests*. To be determined as fire resistant according to the test requirements of this section, the three following results shall be achieved:

(1) The average number of cycles before attaining a self-sustaining flame in the test described in paragraph (c) (3) of this section shall be 24 or more.

(2) The average number of cycles before attaining a self-sustaining flame in the test described in paragraph (c) (4) of this section shall be 18 or more.

(3) The average number of cycles before attaining a self-sustaining flame in the test described in paragraph (c) (5) of this section shall be 12 or more.

§ 35.23 Performance required for certification.

To qualify as fire-resistant under the regulations of this part, a hydraulic fluid shall meet each performance requirement and stated in §§ 35.20(d), 35.21(d), and 35.22(d).