

Materials / Paint

FNHA-2-J-001.47

Persoz Hardness Test

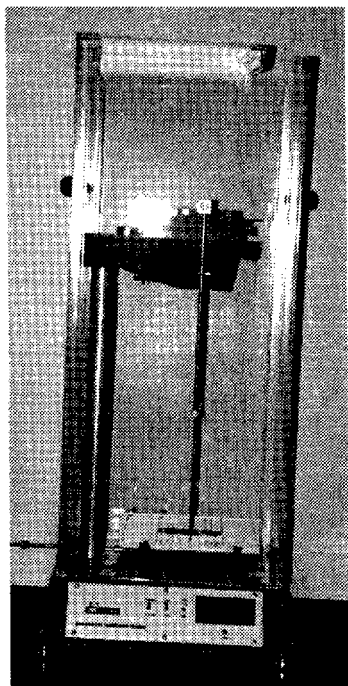
1. SCOPE

This procedure is used to determine the hardness of an organic film. This process is called Persoz or pendulum hardness test. The pendulum balls are rested on the surface of the film and the pendulum is set into oscillation. The time, in seconds, for the oscillation amplitude to decrease from 12° to 4° will be taken as the hardness. The shorter the time the softer the material. Maximum attainable hardness is 430.

2. REFERENCE STANDARDS

ISO 1522 - Paints and Varnishes - Pendulum Damping test.

Figure 1 - Persoz Hardness Testing Machine



3. MATERIALS AND EQUIPMENT

3.1 The Persoz stand shall consist of a heavy vertical rod and an elevated horizontal-working surface. The approximate working area shall be about 95 mm (3.75 in) x 110 mm (4.33 in) and not less than 10 mm (.394 in) thick. This stand shall have a stirrup to support the pendulum away from the working area, so the samples can be inserted easily. There shall be a mechanism that elevates the sample under the pendulum so the sample can engage the balls of the pendulum. Typical Persoz unit is seen in Figure 1.

4. PROCEDURE

4.1 CALIBRATION

4.1.1 The alignment of the pendulum and sample table should be checked. The sample table shall be level, which is determined by the leveling bubble. Adjustment can be made to center the leveling bubble by adjusting the leveling screws on the base of the Persoz Hardness Tester.

4.1.2 Clean the polished glass master with a soft cloth and acetone. Also, clean the balls on the pendulum with a soft cloth and acetone. Allow both parts time to dry.

4.1.3 Place the polished glass master on the sample table and bring it into contact with the pendulum. Make sure the pendulum oscillates freely and comes to rest at the 0° position.

4.1.4 After the pendulum has been stopped and is resting at 0°, deflect the pendulum to 12° and lock it into place with the release cable. Zero the digital counter, set the counter to seconds, and set the beeper to indicate when the test is completed.

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4.1.5 Release the pendulum by letting the release cable go and start a stopwatch and count the swings. 100 swings of the pendulum shall take 100 ± 0.1 seconds.

4.1.6 Repeat step 4.1.4 and release the cable again and allow the pendulum to swing till it decreases to 4° . The beeper shall indicate the test to be completed and the counting has been stopped. The time to decrease the swing of the pendulum shall be 420 ± 10 seconds. This test should be repeated three times and a mean is to be determined. This mean should be within the 420 ± 10 seconds requirements and the three readings shall not be greater than 3% of the mean.

4.1.7 If these values cannot be achieved, repeat all of the above steps.

4.2 DETERMINING THE HARDNESS OF AN ORGANIC FILM

4.2.1 Place an organic film on the sample table, film side up.

4.2.2 Deflect the pendulum 12° and lock it into place with the release cable. Zero the digital counter, set to seconds, and set the beeper to indicate when the test is completed and the counting has stopped.

4.2.3 Release the cable and allow the unit to operate until the beeper indicates the test is completed. Note the value on the meter. This is the hardness of the organic film.

4.2.4 Carry out this test on three different locations on the test sample and record each value. After the readings have been taken, establish the mean value of these readings. This should be the hardness of the material.

4.2.5 Each mean from the three readings on a test sample, taken by the same individual should be considered suspect if these readings differ by more than 3% of their mean.

5. REPORT

The mean hardness reading shall be reported on the Material Laboratory Report.

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