Ford Motor Company

FORD LABORATORY TEST METHOD BI 112-01

SWARD HARDNESS TEST FOR PAINT FILM

Application

This procedure describes the method for determining the hardness of paint films by means of the Sward Hardness Rocker.

Apparatus Required

Sward Hardness Rocker*

With levelling table, shield, panel holder and level.

Rocker

The Rocker consists of two 101.6 mm metal rings spaced 25.4 mm apart. In the lower half are two glass bubble tubes for visually indicating the start and finish of the test.

Levelling Table

The levelling table is nickel-plated brass, 178 x 305 x 6.4 mm. A 3.2 mm piece of bakelite is permanently bolted to the table to form a top surface. The table is levelled by means of two adjusting screws.

Plate Glass

A polished plate glass 178 x 305 x 6.4 mm is furnished for calibration of the Rocker.

Panel Holder

The panel holder is a small screw press or clamp to keep the test panel level.

Cellulose Shield

The transparent shield is attached to the base plate and may be raised or lowered over the rocker after it has been set in motion. The shield prevents air current from influencing the rocker readings.

*Sources:

Gardner Laboratory, Inc.
Bethesda, MD U.S.A.

A. Gallen Kamp & Co. Ltd.
Technico House
Christopher Street
London E.C.2 England

or,

Erichsen GmbH & Co. KG
587 Hemer-Sundwig
Westfalen, Germany

Date	Action	Revisions
2001 03 14	Revised	Editorial – no technical change A. Cockman
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Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

Calibration of the Rocker

1. Insert the standard plate glass in the panel holder.

2. Clean the surface of the plate glass and rocker edges with lens tissue.

3. Place the small bubble level on the plate glass and adjust levelling screws to make the panel level.

4. Place the rocker on the plate glass and the level on the bottom plate of the rocker. Move the adjustable rider as necessary to bring the rocker to a level position.

5. The left hand bubble should now be inclined at an angle of 22 1/2°. This should be checked by laying the rocker flat on a piece of paper on which lines, forming the proper angle, have been drawn. The central horizontal bar of the rocker is laid along the horizontal line on the paper and the left hand bubble tube adjusted so that an inscribed line, forming a 22 1/2° angle with the horizontal line, passes directly through the center of the tube.

6. Having checked the angle of the bubble tube and adjusted the rocker so that it is level, place it on the plate glass and set the rocker in motion with a pencil (or automatic release). The bubble on the left hand tube should travel beyond the mark (rubber ring around the tube) for a few swings.

7. Lower the shield over the rocker. Start a stop watch when the bubble in the left hand rube fails to travel beyond the mark. Call this zero. Stop the watch when the rocker completes 50 oscillations. One swing to the left and a return to the right makes one oscillation. The time for 50 oscillations should be 60 +/- 0.5 seconds. If the time is too short, raise the gravity bob; if too long, lower the bob. Repeat procedure until correct time has been obtained.

8. Now adjust the right hand bubble tube as follows:

   Start the rocker oscillation as before but stop the count and the watch when the bubble in the right hand tube fails to travel beyond the mark. If 50 oscillations in 60 seconds are not obtained, adjust the angle of the right hand tube. Decreasing the angle increased the count; increasing the angle decreases the count.

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