Ford Motor Company

FORD LABORATORY TEST METHOD BU 001-01

MOISTURE VAPOR TRANSMISSION RATE OF WATERPROOF TAPE

Application

This procedure is used for the determination of the water vapor permeability of waterproof pressure sensitive tape.

Description of Test

A sample of tape is placed over the opening in a small aluminum container containing calcium chloride. The assembly is then subjected to high temperature and humidity for specified periods. The gain in weight of the assembly due to moisture pickup by the desiccant is calculated for a definite time and reported as the moisture vapor transmission rate.

Apparatus Required

Test Dishes

Dishes used for this test are aluminum moisture dishes with tight fitting covers. The dishes are approximately 3 1/2 inches in diameter and 2 inches deep. An opening is cut in the cover of the dish 3/4 inch wide and 2 ¾ inches long, over which the tape is applied. This size opening will accommodate 1 inch wide tapes, allowing 1/8 inch on each edge for a seal. Narrower tapes will require correspondingly narrower openings.

Wax

Paraffin wax, U.S.P. grade, free from foreign material, is required for sealing the cover to the moisture dish. The melting point of the paraffin shall be 130 °F minimum.

Desiccant

Calcium chloride, anhydrous, 8-mesh, is placed in the bottom of the dish to absorb any water vapor which passes through the tape specimen.

Humidity Cabinet

The humidity cabinet used in the test shall provide a relative humidity of 90 +/- 5 % at a temperature of 100 +/- 5 °F with no condensation on the test dishes or in the space in which the dishes are placed.

Laboratory Balance

A laboratory balance is required for weighing the test assembly.

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.

Date	Action	Revisions
2000 11 10	Revised	Editorial – no technical change A. Cockman
1992 08 06		

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Procedure

1. Place the cover, with the proper size opening, on the moisture dish and seal the edge with melted paraffin.

2. Transfer approximately 20 g of calcium chloride to the moisture dish and spread evenly across the bottom.

3. Remove three turns of tape from the sample roll and discard before cutting the test specimen, which shall be 3 inches long and 1 inch wide.

   Note: Care must be exercised to prevent touching or otherwise defacing the adhesive side of the tape with the fingers as this will alter the test results.

4. Wipe off the cover of the can and place the tape sample over the opening in the cover. Allow 1/8 inch overlap on all sides of the opening and press firmly in place to effect a tight seal.

5. Condition the assembly in a humidity cabinet at a relative humidity of 90 +/- 5 % and a temperature of 100 +/- 5 °F for 24 h.

6. Remove the test dish from the cabinet and cool for 15 minutes in a room maintained at 72 +/- 5 °F with a relative humidity of 50 % and weigh (W1).

7. Condition as in Step 5 with exposure periods of not less than 48 h each until the vapor transmission rate becomes constant when weighed as in Step 6. This final weight is W2.

8. Report the vapor transmission rate in grams of moisture per 100 sq inch of tape area for 24 h.

$$\text{Vapor transmission rate} = \frac{(W2 - W1) \times 24}{T \times A} \times 100$$

Where:

W1 = weight in grams after 24 h conditioning period

W2 = weight in grams after final exposure period

T = total exposure period in hours after first 24 hour conditioning period

A = area (in sq inch) of opening of aluminum dish.

Chemicals, materials, parts, and equipment referenced in this document must be used and handled properly. Each party is responsible for determining proper use and handling in its facilities.

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