Ford Motor Company

FORD LABORATORY TEST METHOD BO 012-01

RESISTANCE OF POLYURETHANE FOAM TO DETERIORATION

Application

This procedure is used to measure the resistance to deterioration of polyurethane foam under conditions of high humidity, high temperature and mild pressure. Deterioration on seat padding materials is measured by a change in load deflection of the specimen after the humidity test. Crash pads, visors, arm rests, etc. are conditioned in the autoclave and then bent over a mandrel and examined for cracking as evidence of deterioration.

Apparatus Required

Autoclave or Pressure Cooker

An autoclave (see illustration) or steam pressure cooker is required for this test. The apparatus shall be provided with a pressure gage, pressure regulating valve and safety valve. It shall also be equipped with a rack for suspending the test specimens above the water level and shall be large enough to accommodate the 6 by 6 inch test specimens.

The steam pressure cooker may be obtained from the Wisconsin Aluminum Foundry Co., Model No. 25X.

The autoclave shown (Model 999-C) is used at the Body Materials Laboratory. Other equivalent apparatus may be used for this test.

Source: Wilmot Castle Company
Box 629
Rochester 2, New York

Mandrel

A 1/4 inch diameter wooden mandrel is required for specimens other than seat pads where small samples are tested.

Oven

Mechanical convection at 158 +/- 2 °F.

Date	Action	Revisions
2001 03 20		Editorial – no technical change A. Cockman
1992 07 14		

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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

Load Indentation after Aging
Seat Pads

1. A specimen of (slab or molded) polyurethane foam 6 by 6 inches by full depth thickness, where possible, is required for this test, with the exception of pads exceeding 4 inches in thickness. In this case, the bottom shall be trimmed to provide a pad of 3 - 4 inches in depth.

2. Condition all test specimens for 24 h at 72 +/- 5 °F and a relative humidity of 50 +/- 2 %.

3. Place the test specimen on the supporting plate of the indenter, apply a preload of 1 lb and determine the height of the test specimen.

4. The specimen shall then be twice deflected to 75 +/- 5 % of the original height, using either rollers or plates as a means of obtaining the deflection. The specimen shall then be allowed to rest for 10 +/- 5 minutes.

5. Deflect the specimen 25 % of the recorded height and, after exactly one minute, read and record the load.

6. Add sufficient distilled water to the autoclave for the 3 h test but keep the water level below the specimen supporting rack. Place the specimens in the autoclave and securely fasten the top. Set the thermostat control for 216 - 225 °F (gage pressure between 1.3 and 4.3 psi), leave the safety valve open and heat until steam is emitted through the ports of the safety valve. The valve shall be closed 2 minutes after the appearance of steam and the time of the test shall be started at this point.

7. After 3 h in the autoclave, turn off the heat, release the steam pressure, remove the test specimens and dry for 3 h in a mechanical convection oven at 158 +/- 2 °F.

8. Condition the test specimens for at least 2 h and not more than 24 h at 72 +/- 5 °F and 50 +/- 2 % relative humidity.

9. Determine the 25 % compression deflection as in Steps 3 through 5.

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