Ford Motor Company

FORD LABORATORY TEST METHOD BI 104-01

WATER IMMERSION TEST FOR PAINTED PARTS AND PANELS

Application

This method is used to determine the resistance to failure of painted metal and painted plastic parts and representative test panels when immersed in water.

Materials and Apparatus Required

1. Water Bath

The container used for this test shall be made of a non-corrosive material such as glass, porcelain-coated metal or similar materials. For painted panels, the container shall be large enough to accommodate several 150 mm by 300 mm test panels spaced at least 10 mm apart from each other and the wall of the vessel to allow water to flow freely on the painted surface of the part.

The container is filled with distilled or deionized water, conductivity must be no greater than 10 micromhos/cm (20 °C), and maintained at a temperature of 32 +/- 1 °C or as specified using a controlled heater or other suitable means.

The purity of the water must be maintained at 5-ppm maximum total solids content, and a conductivity not exceeding 20 micromhos/cm (20 °C). Water purity should be measured with a Control Company, Model 4075, Digital Conductivity Meter available through Fisher Scientific, Catalogue No. 09-328, @ http://www.fishersci.com/ or VWR Scientific, Catalogue No. 23226-523 @ http://www.vwrsp.com/. Check purity weekly and record results. The water must be changed as often as necessary to meet the above conditions and minimize the formation of slime on the inner surfaces of container.

A mechanically driven mixer with non-corrosive stirring head or air agitation shall be used to maintain a uniform circulation of water around the test panels or parts.

A 6 mm internal diameter rubber hose is to be immersed in the tank at the bottom and air bubbled at the rate of one bubble per second (minimum) to aerate the tank.

2. Racks or Spacers

Non-corrosive insulating material (glass or plastic).

3. Tape

Type 3M #898

Date	Action	Revisions	
2003 01 23	Revised	Rev Section 1, Water Bath and Procedure	B. Harns
2001 03 16	Revised	Editorial – no technical change	A. Cockman
1989 04 19			

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Procedure

A. Test Panels

1. Prepare panels as required by the relevant Engineering Materials Specification. If required by the Engineering Material Specification, panels prepared by Methods B and C shall have one (1) spot (nominally 25 mm) completely sanded through to the bare metal before applying finish color coat. Panels for this test shall have their backs and edges protected, e.g. sprayed with 50 micrometers of primer. There shall be no areas of steel unprotected.

2. Immerse the panels to two-thirds of their length. Panels shall be so arranged that water can flow freely on the panel surfaces and the space between panels must be at least 10 mm so that no electrical contact is possible between them.

3. After the panels have been immersed for the time required by the relevant Engineering Materials Specification, remove, blot dry using clean paper towels or cloth to remove surface liquid only, and examine within 30 minutes for blistering, dulling or loss of adhesion of the finished coat as required in the relevant Engineering Materials Specification.

   Perform an "X" scribe on the coated substrate, 40 mm long by 20 mm wide, 60 degrees between the two top legs, insuring that the cut is into the substrate. Use a carbide tip scriber for rigid substrates and utility knife for elastomers according to FLTM BI 106-01. Apply tape across the surface using firm finger pressure. Remove tape by pulling back rapidly at 90° and report adhesion loss as noted after removal of tape. (Refer to the attachment for the rating system)

   Note: Disregard any failures 5 mm from the edges of the panel.

B. Parts - Painted Sheet Steel

1. The parts shall be prepared by rinsing in water to remove any dirt or contamination which adheres to the painted surface.

2. Immerse the parts completely, maintaining at least 10 mm between the parts and the sides of the container to ensure no electrical contact is possible, and allow water to flow freely about the painted surface.

3. After the parts have been immersed for the time and temperature required by the Materials Specification, remove, blot dry using clean paper towels or cloth to remove surface liquid only. Examine parts within 30 minutes for blistering, dulling, or loss of adhesion of the finish coat. Apply tape across the surface using firm finger pressure. Remove tape by pulling back rapidly at 90° and examine for blistering and/or loss of adhesion.

   Note: Disregard any failures 5 mm from the edge of the part, edge of bolt holes and joints, or as indicated in the Engineering Material Specification.

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