

ADHESION/IMMERSION TEST**Application**

This method is used to measure the relative adhesion of electrocoated and topcoated films to phosphated steel panels. Adhesion is checked before and after warm water immersion.

Apparatus Required**Water Bath**

The container used for this test shall be made of a non-corrosive material such as glass, porcelain-coated metal, stainless steel, or similar materials. The container shall be large enough to accommodate several 100 mm by 300 mm steel panels spaced to allow water to flow freely on the painted surfaces.

The container is filled with distilled or deionized water and maintained at a temperature of 32 +/- 2 °C by a controlled heater or other means.

The purity of the water must be maintained at 5 ppm maximum solids content (ASTM D 1888).

A mechanically driven mixer with non-corrosive stirring rod or air agitation shall be used to maintain a uniform circulation of water around the test panels. The water in the container should be changed as often as necessary to avoid contamination.

A 6 mm 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.

Adhesion Tape

No. 898 (Minnesota Mining and Manufacturing Co. - 3M) 50 mm wide. Use only No. 898 tape that is made in the U.S.A. Store in the original package in a dry, dark location.

Scribing Tool

Gardco (Paul N. Gardner Co.) cross-cut tool (Model P-A-T with 1.5 mm blade teeth spacing) or equivalent.

Source: P. N. Gardner Co.
316 Northeast First Street
Pampano Beach, FL 33060

Date	Action	Revisions
2001 03 14	Revised	Editorial – no technical change A. Cockman
1990 12 04		

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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

1. Using the cross-cut tool, with the knife edges downward the tester is pulled over the panel surface, scratching the coating to the bottom. A second crosswise cut (at an angle of 90°) is made. The scribed surface is brushed to remove loose flakes, the tape is applied by smoothing the center of the tape over the scribed area.
2. Within 1 - 2 minutes the tape is rapidly pulled from the panel at an angle of approx. 135°. The extent of paint removed is a measure of the initial adhesion of the paint system (See Evaluation Paragraph below).
3. Cover the scribed area with 3M #898 tape and place panel in the water immersion tank at 32 +/- 2 °C.
4. After 120 hours (5 days) immersion the panel is removed from the water bath, dried with paper towels, and cross-scribed with the scribing tool. This scribed area is tape pulled in the same manner within 30 minutes from the time the panel was removed from the water bath.

Evaluation

Rate the adhesion according to the following scale:

- | | |
|---|--|
| 5 | The edges of the cuts are completely smooth; none of the squares of the lattice is detached. |
| 4 | Small flakes of the coating are detached at intersections; less than 5 % of the area is affected. |
| 3 | Small flakes of the coating are detached along edges and at intersections of cuts. The area affected is 5 to 15 % of the lattice. |
| 2 | The coating has flaked along the edges and on parts of the squares. The area affected is 15 to 35 % of the lattice. |
| 1 | The coating has flaked along the edges of cuts in large ribbons and whole squares have detached. The area affected is 35 to 65 % of the lattice. |
| 0 | Flaking and detachment worse than Grade 1. |

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.