

Australian Standard™

Paints and related materials—Methods of test

Method 108.2: Dry film thickness—Paint inspection gauge

METHOD

1 SCOPE

This Standard applies to paint coatings or coating systems applied to a rigid substrate. This method is also applicable to determination of the thickness of individual coats in a multicoat system where there is a visually discernible difference between coats. The method is not applicable for soft, friable or ductile substrates that may deform under the test gauge cutting tip. The determination may be carried out in either laboratory or field.

NOTE: This is a destructive test method.

2 PRINCIPLE

The thickness is determined by scoring the paint film with the appropriate cutting tip of the gauge and measuring the paint film thickness with the gauging microscope. The procedure is repeated as specified.

3 OCCUPATIONAL HEALTH AND SAFETY

Exercise care when handling sharp cutting tools.

4 APPARATUS

4.1 Paint inspection gauge

Consisting of a microscope, typically of 50× magnification, fitted with a calibrated graticule and an appropriate tungsten carbide cutting tip whose angle, θ , is known.

NOTE: Paint inspection gauges are supplied with a number of cutting tips of different angles and the tip chosen for the test should be carefully noted.

4.2 Felt-tip marker

Of colour contrasting with that of the top coat of the system being tested.

5 PROCEDURE

The procedure is as follows:

- (a) Select the cutting tip appropriate for the expected film thickness.
- (b) Make a straight line mark approximately 25 mm long, on the coating in the area where the thickness is to be determined, using the felt-tip marker.
- (c) Make the test panel secure, if appropriate.
- (d) Hold the cutting tip assembly of the paint inspection gauge with the cutting tip about 25 mm away from, but directed at right angles to, the line mark left by the felt-tip marker.

- (e) Score the film, including the line mark region, at a cutting rate of approximately 50 mm/sec to form a groove at least 50 mm long. Ensure that the cutting tip penetrates to the substrate for the full length of the score. Score the film by pulling the gauge towards you.

NOTE: The action of the cutting tip causes a strip of paint film to detach from the substrate leaving a groove which displays even continuous strips of sheared paint, exposed substrate interface and sheared substrate. (See Figure 1.)

- (f) Locate the gauging microscope at the intersection of the groove and the line mark and measure the film thickness, or that of each coat where the thickness of individual coats is required, by means of the microscope graticule.

NOTES:

- 1 Refer to the manufacturer's instructions to determine the relationship between the number of graduations and the film thickness for the particular cutting tip used.
- 2 Stripping or chipping of the coating due to poor adhesion or brittleness of the system may interfere with this method, especially when determining the thickness of intermediate coats in a multicoat system.

- (g) Repeat Steps (a) to (f) the specified number of times at different locations on the test surface and record the film thickness, or thickness of individual coats, each time.

NOTE: In field situations, further determinations may be required.

6 TEST REPORT

When a test report is issued, it shall include the following information:

- (a) Name of testing authority.
- (b) Name of person performing the test.
- (c) Date of test and report number.
- (d) Identification or description of the product or system.
- (e) Type of instrument and cutting tip used.
- (f) Type of test panel or substrate and a description of any surface preparation, if appropriate.
- (g) Method of application and time and conditions of curing of the panel, if appropriate.
- (h) The film thickness, expressed in micrometres (μm) to two significant figures, at each location.
- (i) Whether it is a single coat or a multicoat system and, in the case of the latter, and where determinable, the number of coatings and thickness of each coating.
- (j) Reference to this Australian Standard, i.e., AS 1580.108.2.