DEFORMATION

Sheen

REF. 760 CUPPING TEST MACHINE

APPLICATION

The Ref 760 Cupping Test Machine, tests the elasticity and adhesive qualities of laquers, paints and other protective coatings applied to a metal substrate. The test method is described in ISO 1520, BS 3900 E4, DIN/ISO 1520. The standards call for a hemisperical indenter of 20mm diameter made from hardened polished steel. The indenter is applied under pressure to the uncoated side of the test panel, concentric with the indenter is a corresponding die. As the test panel is deformed the coated surface is kept under observation.

FEATURES

- EASY TO USE
- ROBUST MECHANICAL CONSTRUCTION
- REPRODUCIBLE RESULTS AT AN ECONOMIC COST
- MINIMAL MAINTENANCE REQUIREMENT

DETERMINATION

The test may be carried out using one of two procedures 'Predetermined depth (go/no go)' or 'Minimum depth required to cause failure'. The methods are detailed under the general procedure below.

TEST PANELS

The recommended test panels are rectangular of not less than 70mm square (instrument capacity 90mm wide) of burnished steel with a thickness of not less than 0.3mm to a maximum of 1.25mm. Testing using a maximum test panel thickness of 1.25mm and a tensile strength not exceeding 280N / mm^2 (Mpa) a deformation of 7mm can be achieved.

GENERAL TEST PROCEDURES

The following procedures are for guidance only, for a more detailed explanation refer to the method defined in the relevant National Standard.

1. PREDETERMINED DEPTH (GO/NO GO)

The following procedure shall be carried out on separate test panels (if the results differ, additional tests shall be made).

Hold the test panel firmly between the retaining and the die with the coating towards the die and with the hemispherical end of the indenter in contact with the test panel (zero position of the indenter). Adjust the panel until the central axis of the indenter intersects the panel at least 35mm from each edge.

Advance the hemispherical end of the indenter into the test piece at a constant rate of approximately 0.2mm/s until the specified depth is reached i.e. until the indenter has travelled this distance from the zero position.

Using normal corrected vision or, by agreement, a magnifier, examine the coating of the test panel for cracking and/or detachment from the substrate.

When removing the test panel, first slacken the indenter handwheel to relieve pressure, then unscrew the upper clamping wheel to free the panel.

NOTE 1. If a lens is used, it is essential to mention this fact in the test report and to avoid misleading comparisons with results obtained using normal corrected vision only.

NOTE 2. The test results shall not be regarded as valid if the substrate shows signs of cracking.

2. MINIMUM DEPTH REQUIRED TO CAUSE FAILURE

Carry out the procedure in Test 1 until, using normal corrected vision (or by agreement, a magnifier), a crack is first observed on the surface of the coating and/or the coating begins to become detached from the substrate **. Stop the indenter at this point and measure the depth of the indentation to the nearest 0.1mm, i.e. the distance travelled by the indenter from the zero position. Confirm the result by repeating the determination on a fresh panel (if the results differ, further determinations shall be made).

** In order to advance observation of the end point it is permissible to reduce slightly the rate of advance of the indenter when approaching the expected end point determined, in a preliminary test).

S h e e n I n s t r u m e n t s L t d
Unit 4, St. Georges Ind. Est., Richmond Road, Kingston, KT2 5BQ England.
Tel: 020 8541 4333 Fax: 020 8549 3374 Intl.Tel: 44 20 8541 4333 Intl.Fax: 44 20 8549 3374
01/05 Internet : www.sheeninstruments.com Email: info@sheeninstruments.com