STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS OF TEST FOR METALLIC AND RELATED COATINGS

PART 4—PHYSICAL TESTS

AS 2331.4.4—1985 ASSESSMENT OF INTENSITY OF SHOT-PEENING

1 SCOPE. This standard sets out a method of assessing the intensity of shot-peening.

2 APPLICATION. Shot-peening is used on steels prior to plating where the steels in question cannot be heat-treated in the temperature range of 400°C to 480°C without loss of temper. It is also used on items to be subsequently chromium plated where a drop-off in hardness of chromium as a result of heat treatment for hydrogen embrittlement cannot be tolerated.

The method is used to assess that the correct profile height of peening has been obtained prior to plating.

3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1447 Hot-rolled Spring Steels

AS 1817 Method for Vickers Hardness Test Part 1—Testing of Metals.

4 PRINCIPLE. Standard steel test panels are shot-peened under known conditions. The resultant profile height is measured by means of a depth gauge. Peening conditions are modified until the correct profile height has been obtained.

5 APPARATUS. The following apparatus is required:

(a) Shot-peening apparatus.

(b) Shot-peening fixture (see Fig.1).

(c) Cut wire or round shot-peening media.

(d) Carbon steel test panels conforming to AS 1447, Grade K 1070S. The nominal thickness of test panels shall be 1.4 mm to 1.6 mm and the hardness shall be within 400 HV to 500 HV, when determined in accordance with AS 1817.1.

NOTE: Steel strip complying with the above chemical composition and hardness is commercially available in Australia. However, where steel is sold in the spheroidized condition, oil quenching from 820°C to 830°C followed by tempering at 420°C to 430°C should reproduce the appropriate hardness.

6 PREPARATION OF TEST PANELS. Test panels shall be cut 20 mm wide by 75 mm long. Tolerance on these dimensions shall be +0, -0.2 mm. Test panels shall then be fine ground to achieve a thickness of 1.3 ±0.02 mm.

Any deviation from flatness shall not exceed an arc height of 0.038 mm when measured as described in Clause 7.

7 PROCEDURE. Intensity of shot-peening shall be assessed as follows:

(a) Clamp test panel in the shot-peening fixture.

(b) Shot-peen test panel using cut wire or round shot, for the same period of time and under the same processing conditions as for production items.

(c) After shot-peening, remove test panel from the fixture and measure curvature of the unpeened surface by means of a depth gauge. Panels shall be supported on four 5 mm diameter steel balls forming a rectangle having dimensions of 32 mm × 16 mm.

(d) Align stylus of the depth gauge on the centre of the test panel and measure arc height at the centre of the panel over gauge length of 32 mm. Measurements shall be taken to the nearest 0.025 mm.

(e) Adjust shot peening conditions until required arc height has been obtained.

NOTE: Conditions used to produce the required arc height are used to process items before plating.