

Australian/New Zealand Standard®

Methods of test for pressure-sensitive adhesive tape

Method 10.1: Resistance to shear loading at elevated temperatures

1 SCOPE This Standard sets out the method for determining the ability of pressure-sensitive adhesive tape to resist shear loading at elevated temperatures.

2 REFERENCED DOCUMENT The following document is referred to in this Standard:

AS
1683 Methods of test for elastomers
1683.15.2 Method 15.2: Durometer hardness

3 REAGENT Methyl ethyl ketone (MEK), reagent grade, is required.

NOTE: Acetone, reagent grade, may also be used.

4 APPARATUS AND MATERIALS The following apparatus and materials are required:

- (a) *Steel roller* (see Figure 1)—of diameter 80 ± 5 mm and width 45 ± 1 mm, covered with rubber approximately 6 mm thick, and having a durometer hardness of 80 ± 5 Type A degrees (see AS 1683.15.2).

NOTE: The mass of the roller proper (which applies pressure to the specimen) should be 2.0 ± 0.1 kg. It should be so constructed that the mass of the handle is not added to the mass of the roller during use.

- (b) *Two stainless steel panels*—approximately 50 mm wide, at least 125 mm long, and approximately 1.5 mm thick and finished in the lengthwise direction to a bright annealed finish which has a surface finish of $0.04 \mu\text{m}$.
- (c) *Specimen cutter*—consisting of a 25 mm thick $\times$ 200 mm long $\times$ 25 mm wide aluminium bar stock. The edges for about 125 mm from one end shall be rounded slightly to form a handle. The width of the bar for 75 mm from the opposite end shall be narrowed to exactly 12 mm minus the thickness of a single razor blade (one of two razor blades used as cutting edges). The razor blades shall be held in position using side plates. The end of the cutter shall be cut away at a 45° angle to expose the cutting edge at one end of the blades. The edges shall be separated by a distance of 12 ± 0.25 mm.
- (d) *Electric oven*—thermostatically controlled at a temperature of $49 \pm 1^\circ\text{C}$.
- (e) *Fresh absorbent cleaning material*—e.g. surgical gauze, untreated paper tissue.
- (f) *Bond paper*—of mass 60 gsm to 100 gsm.
- (g) *Weight*—of mass $1000 \pm 5\text{g}$.

- (h) *Test stand.*
- (i) *Timer.*
- (j) *Clamp*—having a mass not greater than 5 g that will ensure that the weight does not fall off the test assembly.

5 TEST CONDITIONS Testing shall be conducted at $49 \pm 1^\circ\text{C}$.

6 PREPARATION OF TEST SPECIMENS The roll, from which the test specimens are to be taken, shall be conditioned at $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity for 24 ± 1 h prior to testing.

Test specimens shall be at least 250 mm long, and at least five shall be tested.

7 PROCEDURE The procedure shall be as follows:

- (a) Clean a test panel by dispensing the methyl ethyl ketone (MEK) on the stainless steel panel and wipe until dry with the fresh absorbent cleaning material. Repeat this procedure for a total of three washes. Discard cleaned panels showing stains, discoloration or scratches. Avoid contact of the panel surface with the fingers.

NOTE: Either surgical gauze or untreated paper tissue can be used as the cleaning material, as these are lint free and contain no additives which are soluble in the solvent.

- (b) Take a test specimen from a freely rotating conditioned roll, the minimum width of which shall be 6 mm, by manually unrolling the roll radially and after discarding the outer three laps of the roll.

NOTE: The speed of removal of the test specimen from the roll is operator-dependent. Usually, a speed of approximately 300 mm/s is attained.

- (c) Where the width of a roll is 12 mm wide, use the test specimen direct.

NOTE: A roll, less than 12 mm wide, should not be used for testing purposes.

- (d) Where a roll is greater than 12 mm wide, cut the roll, using the specimen cutter, to a width of 12 mm.

- (e) Apply the test specimen, adhesive side down, to the centre of the surface of the cleaned stainless steel panel and parallel to its long axis, leaving approximately 50 mm of the test specimen extending beyond the edge of the stainless steel panel. Do not allow the adhesive surface to come in contact with the fingers and other foreign objects, or to become contaminated with dust.

- (f) Mask the adhesive surface of the free end by applying a strip of 12 mm wide bond paper to the adhesive side.

- (g) To prevent the test specimen being cut by the end of the stainless steel panel, place the other stainless steel panel under the free masked end of the test specimen, and in contact with the end of the cleaned stainless steel panel prior to rolling.

- (h) Using the steel roller, roll the test specimen on the cleaned stainless steel panel once in each direction along its length at a rate of approximately 5 mm/s. Ensure that no pressure additional to the mass of the roller is applied and that no air bubbles are entrapped.

- (i) Measure a distance of 12 mm from the edge of the cleaned stainless steel panel from which the test specimen overhangs, cut the specimen squarely at that measurement, and remove the trim extending beyond the test specimen, to leave an area of 12 mm $\times$ 12 mm adhering to the stainless steel panel.