

Australian/New Zealand Standard®

Methods of test for pressure-sensitive adhesive tape

Method 21.1: Mending stability

1 SCOPE This Standard sets out the method for determining whether a pressure-sensitive adhesive tape is suitable for long-term mending of paper by qualitatively assessing adhesive ooze and colour stability.

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

NOTE: Acetone may also be used.

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

- (a) *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 with a surface finish of 0.04 μm .
- (b) *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.

- (c) *Humidity cabinet*—providing a relative humidity of $80 \pm 5\%$ at a temperature of $65 \pm 2^\circ\text{C}$ with no condensation on the test dishes or in the space in which the test panels are placed. The circulation over the test panels shall be regarded as negligible.

Alternatively, a desiccator or other suitable vessel containing a saturated solution of ammonium sulfate may be used to provide an atmosphere of approximately 80% relative humidity when maintained at a temperature of $65 \pm 2^\circ\text{C}$ in a suitably regulated electric oven.

NOTE: Ammonium sulfate solution with excess solid at a temperature of 65°C gives a relative humidity of approximately 80%.

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- (d) *White bond paper*—at least 100 mm in length.
NOTE: White bond 80 g/m² paper, obtainable from paper merchants, is suitable.
- (e) *Electric oven*—thermostatically controlled at a temperature of 65 ±2°C.
- (f) *Razor blade*.
- (g) *Fresh absorbent cleaning material*—e.g. surgical gauze, untreated paper tissue.
- (h) *Weight*—having a mass of 1 ±0.01 kg.

5 TEST CONDITIONS Testing shall be conducted at 23 ±2°C and 50 ±5% relative humidity.

6 PREPARATION OF TEST SPECIMENS The roll, from which two test specimens are to be taken, shall be conditioned at 23 ±2°C and 50 ±5% relative humidity for 24 ±1 h prior to testing.

The test specimens shall be 100 mm long and 12 mm wide.

7 PROCEDURE The procedure shall be as follows:

- (a) Dispense the methyl ethyl ketone (MEK) on the two clean stainless steel panels and wipe until dry with the fresh absorbent cleaning material. Repeat this procedure for a total of 3 washes. Discard cleaned panels showing stains, discolouration or scratches. Avoid contact between the panel surface and 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 soluble additives.
- (b) Take two test specimens from a freely rotating conditioned roll by manually unrolling the roll radially and discarding the outer three laps.
NOTE: The speed of removal of the test specimens 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 specimens direct.
- (d) Where a roll is greater than 12 mm wide, cut the roll using the razor blade to a width of 12 mm.
- (e) Affix the two specimens, side by side, to a piece of the bond paper. Do not allow the adhesive surface to come in contact with the fingers and other foreign objects, or to become contaminated with dust.
- (f) Lay a similar piece of bond paper against the backing of the tape.
- (g) Using the steel roller, roll the test specimens once in each direction along their 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.
- (h) Place the two test specimens between the two stainless steel panels.
- (i) Add the weight to the top steel panel.
- (j) Place the whole assembly in the humidity cabinet (or desiccator). If using a desiccator, transfer the desiccator to the heated electric oven.
- (k) After 72 ±1 h, remove the assembly from the humidity cabinet (or desiccator) and allow to cool to room temperature for 2 h, with the weight remaining in place on the top panel.
- (l) Remove the weight.
- (m) Remove the top piece of bond paper and observe whether separation occurs readily with no pulling of the fibres from the top bond piece.
- (n) Observe any colour change, either on the tape itself or staining on the paper.