

Australian Standard®

Methods of test for single sided and double sided pressure-sensitive adhesive tape

Method 3.5: Ageing properties—Determining dimensional stability of label stock

PREFACE

This Standard was prepared by the Standards Australia Committee PK-025, Packaging Code at the request of Australian Industry.

The objective of this Standard is to specify a method of test to determine the dimensional stability of label stock.

METHOD

1 SCOPE

This Standard specifies a method for determining the thickness of release liner of pressure-sensitive adhesive label stock.

2 REFERENCE DOCUMENTS

The following documents are referred to in this Standard:

AS

2400 Packaging

2400.1 Part 1: Glossary of packaging terms

ASTM

G154 Standard practice for operating fluorescent light apparatus for UV exposure of nonmetallic materials

3 DEFINITIONS

For the purposes of this Standard, the following definitions in AS 2400.1 apply.

4 PRINCIPLE

Test specimens of the label stock are applied to polished stainless steel panels and, after 24 h, the dimensions are measured. The specimens are then subjected to artificial weathering, water immersion and temperature cycles, the dimensions remeasured after each individual treatment and the changes calculated as a percentage.

5 APPARATUS

The following apparatus is required:

- (a) Five rigid stainless steel panels, $\geq 125 \text{ mm} \times \geq 30 \text{ mm}$ and finished in the lengthwise direction to a mirror finish, degreased by repeated swabbings using untreated paper tissue and either acetone or a mixture of equal volumes of toluene, methylethyl ketone and industrial methylated spirits, dried at 80°C for 15 min and cooled in a desiccator to the test temperature ($23 \pm 5^\circ\text{C}$).

NOTE: Other surfaces, e.g. glass, aluminium, polyester, can also be used for the panels.

- (b) A steel roller $80 \pm 5 \text{ mm}$ diameter and $45 \pm 1 \text{ mm}$ wide covered with rubber approximately 6 mm thick and having a Shore durometer hardness of 80 ± 5 . The mass of the roller proper which applies pressure to the specimen shall be $2.0 \pm 0.1 \text{ kg}$. It shall be so constructed that the mass of the handle is not added to the mass of the roller during use.
- (c) Artificial weathering machine, such as a fluorescent ultraviolet-condensation type complying with ASTM G154.
- (d) An oven capable of being controlled at $50 \pm 2^\circ\text{C}$.
- (e) A refrigerator capable of being controlled at $-3 \pm 2^\circ\text{C}$.

6 TEST SPECIMENS

Fifteen test specimens, each measuring approximately $120 \text{ mm} \times 80 \text{ mm}$ with parallel edges, are required. If the label is too small to comply with this dimensional requirement, cut the specimen from the label stock from which the labels were converted.

7 PROCEDURE

The procedure shall be as follows:

- (a) For each specimen, remove the protective release liner and apply to the substrate panel with the aid of the roller*. As the test specimens are 80 mm wide and the roller is only 45 mm wide, make two passes of the roller in the same direction with the first pass just overlapping one edge, so that the two passes just overlap in the middle of approximately 6 s for each traverse of 120 mm, taking care that only the mass of the roller is applied and that no air bubbles are entrapped. Take care, also, to not stretch sensitive films.
- (b) Allow to stand at $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity for 24 h.
- (c) Measure the length and width dimensions to the nearest 0.2 mm and average their values (original values).
- (d) Expose five of the assemblies to artificial weathering in accordance with ASTM G154 for 2000 h.
- (e) Allow to stand at $23 \pm 5^\circ\text{C}$ and $50 \pm 5\%$ relative humidity for 24 h.
- (f) Remeasure the dimensions to the nearest 0.2 mm.
- (g) Calculate the percentage change in each dimension for each specimen and average the values for the length and width dimensions.
- (h) Immerse five of the remaining 10 specimens in not less than 1 L of distilled water at $23 \pm 5^\circ\text{C}$ for 24 h.

* For encapsulated adhesives, the manufacturer should be consulted regarding the application