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Adherence to Linerboard Of Pressure Sensitive Tapes At Low Temperature

1. DEFINITION

1.1 This method provides one procedure for determining the adherence of pressure sensitive tapes to a standard linerboard or other similar surface.

2. SIGNIFICANCE

2.1 Satisfactory tape performance at the test temperature implies satisfactory cold temperature performance at or above the test temperature.

2.2 This procedure would be applicable for questions of adherence to 100% kraft fiberboard similar to the standard linerboard surface without substitution but for direct information on any board or surface the actual surface in question should be substituted.

3. TEST SPECIMEN

3.1 The specimen shall be 12 mm to 24 mm (0.5" to 1.0") wide. The length shall be a maximum of 150 mm (6.0").

3.2 Remove specimens from the rolls at a rate of 50 to 75 cm/s (20 to 30"/s) after having first unwound at least three but no more than six wraps of tape (see Appendix D).

4. EQUIPMENT

4.1 NIST (National Institute of Standards and Technology, USA) Standard Reference Material 1810A,¹ length approximately 275 mm (11"), width approximately 12 mm (1/2") wider than the specimen width (see 3.1). When agreed upon by the parties involved or when called for by the material specification, other flexible material may be substituted for the 1810 linerboard.

4.2 Roller, 2 kg (4 1/2 lb.), rubber covered. See Appendix B.

4.3 Oven, circulating, maintained at 65.5°C ± 1°C (150°F ± 2°F).

4.4 Cold chamber, maintained at a specified temperature, -54°C ± 1°C (-65°F ± 2°F), if no other temperature is specified.

4.5 Nonrotating, smooth surface, metal cylinder, having a diameter of 37.5 ± 6 mm (1.5 ± 0.25") and minimum length of 50 mm (2") fixed to a base of support for use as a mandrel around which to flex the tape specimen assembly (see Figure 1).

5. TEST METHOD

5.1 Except when stated elsewhere in this method, prepare and condition the sample material in an atmosphere uniformly maintained at standard conditions (see Appendix A) for a period of not less than 24 hours.

5.2 Apply the specimen centrally to the linerboard strip. Roll over the tape against a flat smooth surface using the rubber-covered roller. Make two passes, one in each lengthwise direction at the rate of 300 mm/min (12"/min).

¹Standard Reference Material 1810A is available from the Office of Standard Reference Materials, National Institute of Standards and Technology, Washington D.C. 20234.

5.3 Expose the specimen assembly to a temperature of $65.5^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ($150^{\circ}\text{F} \pm 2^{\circ}\text{F}$) for 24 hours. Within the next 24 hours, expose the specimen assembly together with the 37.5 mm (1.5") mandrel, to the specified temperature for 2 hours. If no temperature is specified, specimen should be conditioned at -71°C ($-65^{\circ}\text{F} \pm 2^{\circ}\text{F}$) in the cold chamber for 2 hours.

5.4 With the specimen removed from the cold environment, nor effecting any change in that temperature, hold an extreme end (linerboard only) in each hand. With the linerboard side of the assembly against the mandrel, draw first one end and then the other forward so that both ends of tape on the linerboard will have formed into the curve of the mandrel. Draw the ends forward in turn at the rate of 600 mm/s (24"/s). Keep the ends of the assembly taut and parallel forming an 180° bend. End the drawing with the assembly at the same position as when starting, having completed one complete cycle.

5.5 Observe the tape and linerboard during and following the drawing for any evidence of release of tape from the linerboard.

6. REPORT

6.1 Report temperature at which the test was conducted.

6.2 Report the observation made in 5.5, that is, whether the tape did or did not release from the linerboard.

Another method for measuring adherence to linerboard of pressure sensitive tape at low temperature is ASTM D 3889.

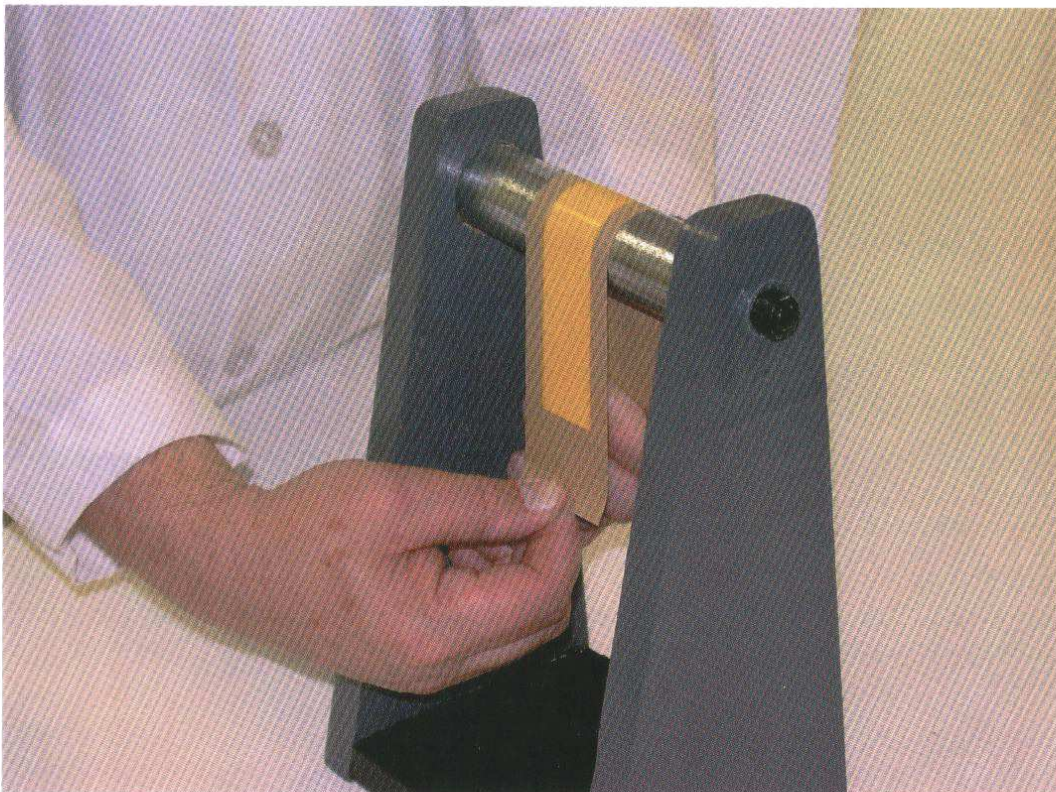


Figure 1. Mandrel for adherence to linerboard test.

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