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**PERFECT** INTERNATIONAL INSTRUMENT  
**东莞宝大仪器有限公司**  
 全球服务电话: 400-6677223  
**Strength After Solvent Immersion**  
**Global Grade Tapes**

**1. DEFINITION**

1.1 Shear strength after solvent immersion is the force required to separate by shear a cured bond of given dimensions after immersion in a typical varnish solvent under designated conditions. It is a measure of the resistance of a cured tape adhesive to the action of a specific solvent.

**2. SIGNIFICANCE**

2.1 This is one method of quantifying the bond with pressure sensitive tapes when exposed to organic solvents. It is limited in that adhesion to itself or backing only are considered, while in-use tapes are generally adhered to various surfaces. Also, the solvent action is at room temperature, while often hot solvent action occurs in application. This method is not applicable to elastoplastic backings.

**3. TEST SPECIMENS**

3.1 Condition the roll per Appendices A and D. The sample shall be placed so that the conditioning atmosphere shall have free access to all normally exposed surfaces of the sample roll.

3.2 Discard at least three but no more than six outer wraps of the tape from the sample roll.

3.3 Six 24 mm (1")-long specimens shall be removed from the roll so that the adhesive surface contacts neither the fingers nor any foreign object. Each specimen shall consist of two strips fastened together to form a 12 mm (1/2")-long adhesive-to-adhesive or adhesive-to-backing lap joint. A 2,040 g ± 45 g (4 1/2 lb.) rubber-covered steel roller (see Appendix B) without application of additional pressure, shall then be passed over the joint once in each direction at the rate of 10 ± 0.5 mm/s. The specimen shall be cut to 12 mm (1/2") width with a sharp razor blade.

**4. EQUIPMENT (See Appendix B)**

4.1 A 2,040 ± 45 g (4 1/2 lb.) rubber-covered steel roller. ChemInstruments:  
[www.ChemInstruments.com](http://www.ChemInstruments.com)

4.2 Oven, forced air capable of maintaining 130°C ± 2°C (266°F ± 3.6°F), (VWR.com, etc.)

4.3 Xylenes, lab or reagent grade ([www.VWR.com](http://www.VWR.com) or [www.FisherScientific.com](http://www.FisherScientific.com))

4.4 Blotting paper ([www.VWR.com](http://www.VWR.com) or [www.FisherScientific.com](http://www.FisherScientific.com))

4.5 Tensile tester (see Appendix B). with appropriate load cell for range being tested.  
[www.Thwingalbert.com](http://www.Thwingalbert.com), [www.Instron.com](http://www.Instron.com), [www.ChemInstruments.com](http://www.ChemInstruments.com)

4.6 A 150 gram ± 1.5 gram weight.

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## 5. TEST METHOD

5.1 Shear strength adhesive-to-adhesive: cure three adhesive-to-adhesive specimens in an air-circulating oven maintained at  $30^{\circ}\text{C} \pm 2^{\circ}\text{C}$  ( $266^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$ ) for 2 hours with a 150 gram load placed on the splice of the alternate conditions if agreed upon by the manufacturer and the customer. After curing, immerse the specimens for 16 hours at room temperature in water-free xylene  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  ( $73.4^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$ ). Heptane or other specified solvent may be used by agreement. Place the specimens on clean blotting paper for 30 minutes, turn sample over after 15 minutes. Determine the breaking strength of the bond. Clamp specimen tightly in jaws of tensile tester. Make certain that edges of the sample are parallel with the jaws of the tensile tester. Pull apart at a speed of 300 mm (12"/minute) until the bond separates.

5.2 Shear strength adhesive-to-backing: same as 5.1 except use adhesive-to-backing sample.

## 6. REPORT

6.1 Complete identification of the tape.

6.2 Identification of the solvent used.

6.3 Identification of alternate conditions if agreed upon between manufacturer and customer.

6.4 Kind of test, adhesive-to-adhesive or adhesive-to-backing.

6.5 Average shear strength of bond obtained expressed in pounds-force per inch, plus the maximum, if specified. Note breakage of tape if such occurs.

6.6 Differences in test results of  $< 2.3$  kg (5 lbs.) per inch width have no significance.

6.7 A minimum of three samples from three random rolls is acceptable.

Another method for measuring shear strength after solvent immersion of electrical grade tape is ASTM D 1000.

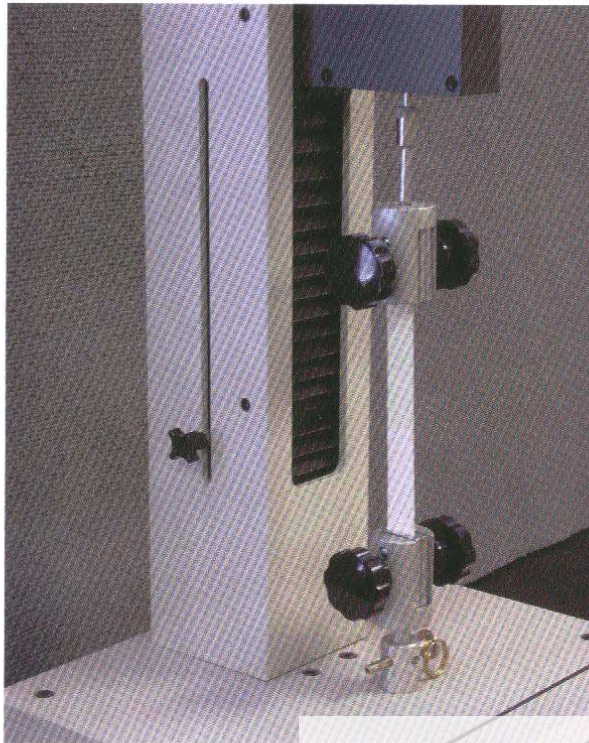


Figure 1. Sample in tensile tester.