

Method for Evaluating the Adhesion Characteristics of Automotive Sealers

- 1. Scope**—This SAE Recommended Practice describes a method for evaluating the adhesion characteristics of automotive sealers including the determination of the minimum film thickness necessary to cohesive failure and the measurement of peel strength.
- 2. References**—There are no referenced publications specified herein.
- 3. Principal of Methods**—This SAE test procedure contains two separate methods. Method A involves curing a wedged shaped patch of non-leveling¹ sealer and determining the minimum thickness necessary for cohesive failure. Method B involves the curing of a sealer slab of uniform thickness and the determination of its peel strength via a Hunter scale.
- 4. Equipment and Supplies**
 - Mechanical convection oven
 - Ample supply of 100 mm x 300 mm test panels as specified
 - Masking tape
 - Spacer bar 100 mm x 3.0 mm (4 in x 0.120 in)
 - Straight edge 230 mm (9 in) long
 - Micrometer
 - Sealer to be tested
 - Razor blade
 - Squared spatula
 - Hunter scale (0–90 N scale)
 - Pinch clamp
 - Sealer template - 200 mm x 90 mm x 0.5 mm (8 in x 3.5 in x 0.020 in)
- 5. Sealant Sample Conditioning**—Mechanical and or thermal conditioning of the sealer may be required of the tester and should be done as specified by the manufacturer prior to testing.

1. If results on a self-leveling sealer are desired in Method A, the sides of the uncured sealer patch must be contained and the panel must be angled to keep the sealer surface parallel to the baking surface.

6. Panel Preparation—Method A (see Figure 1.)

6.1 Mask the desired number and type of 100 mm x 300 mm (4 in x 12 in) panels as shown in Figure 1.

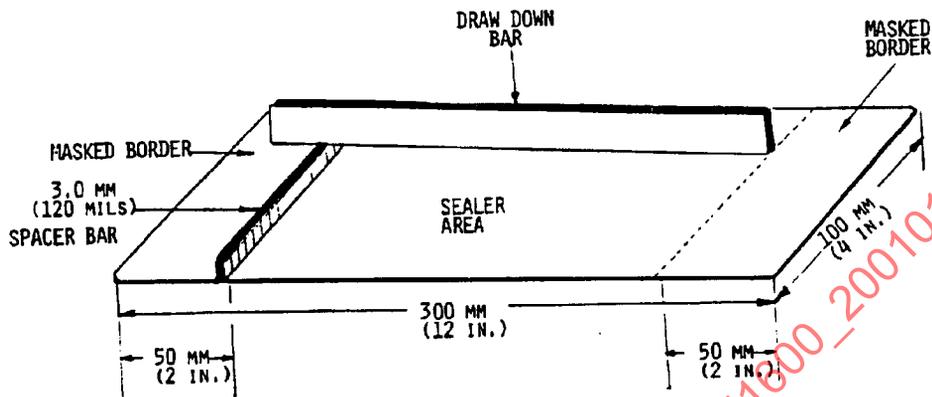


FIGURE 1—METHOD "A"

- 6.2 Apply a layer of the sealer, to the untaped center section, in excess of 3.0 mm (0.120 in).
- 6.3 Place the spacer bar at one end of the panel along the line between the tape and the sealer. Place the spacer bar so that the 3.0 mm (0.120 in) measurement is in the vertical position.
- 6.4 Place the draw down bar with one end resting directly on the panel at one end of the sealer-tape border at the opposite end from the spacer bar. Let the other end of the bar rest on the spacer.
- 6.5 Using a uniform motion, pull the draw down bar across the width of the panel leaving a tapered wedge of sealer.
- 6.6 Remove the spacer and the masking tape.
- 6.7 Bake the coated panel as specified.
- 6.8 Cool panel to room temperature or as specified before evaluation.
- 7. Observations**
- 7.1 Using a razor, cut three parallel strips, 25 mm (1 in) wide, from the slab. The cuts should run the length of the slab.
- 7.2 Using a squared off spatula, undercut the thick and thin ends of each strip 3 mm (1/8 in).
- 7.3 Using your fingers, grasp the undercut ends produced in 7.2 and slowly peel back the sealer at an angle of 180 degrees until the film breaks.
- 8. Report**—Record sealer adhesion at each end of the three strips in 7.3 indicating the type of failure, the thickness of the film at failure (via a micrometer), and whether or not the sealer "gassed."

9. **Panel Preparation**—Method B (see Figure 2.)

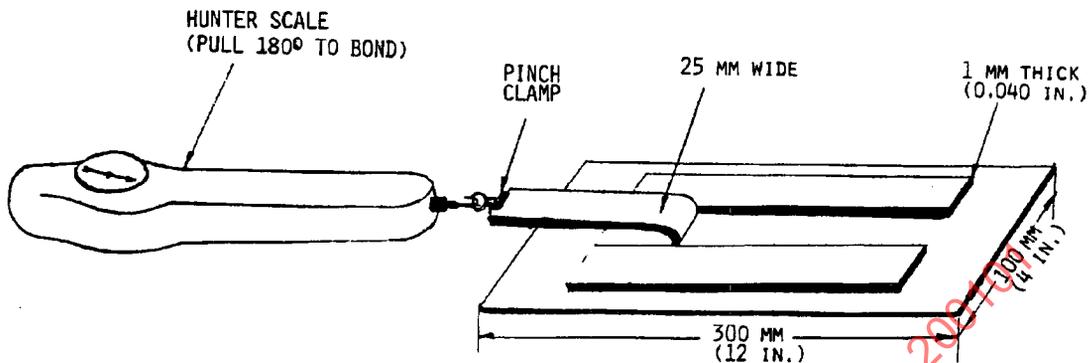


FIGURE 2—METHOD "B"

- 9.1 Secure sealer template 200 mm x 90 mm x 0.5 mm or as specified to the test panel.
- 9.2 Apply sealer to the center section.
- 9.3 Using a uniform motion, pull the draw down bar across the template leaving a uniform slab of sealer.
- 9.4 Remove the template if sealer is non-leveling. If sealer is self-leveling, leave template in place through the cure cycle.
- 9.5 Bake the coated panel as specified. If template is being used, remove it after the bake.
- 9.6 Cool panel to room temperature or as specified before evaluation.
10. **Observations**
- 10.1 Using a razor, cut three parallel strips, 25 mm (1 in) wide, from the slab. The cuts should run the length of the slab.
- 10.2 Using a squared off spatula, undercut one end of each strip by 3 mm (1/8 in).
- 10.3 Attach a pinch clamp to the undercut end of 10.2.
- 10.4 Attach Hunter scale to the pinch clamp affixed in 10.3.
- 10.5 Slowly peel back the sealer at an angle of 180 degrees and note reading on the Hunter scale.
11. **Report**—Record for each of the three steps in 10.5 the Hunter scale value and the type failure observed.