

## Mactac SAG 53 and SAG 175 as Glass Protection film Application Guide

**MACtac SAG 53 and SAG 175** are specialized ultra-clear polyester films designed for **INTERIOR WINDOWS AND ANTI-GRAFFITI LAMINATES**. When applied to the inside train windows, they protect the glass from scratches, abrasion and graffiti, and offer additional safety features against glass breakage. These SAG films are engineered to be virtually **invisible** on glass when installed correctly.



**The key to a successful application is:**

**A clean window!**

**Wet application using non foaming application fluid and**

**Using the**

**right tools.**

**Tools Required (Fig.1):**



**Figure 1: Cleaning and Installation Tools for MACtac SAG films**

### **1. Prepare the wet application solution:**

- a. A solution of Johnson’s Baby Shampoo and water helps position the SAG films properly on the window and results in a perfect, bubble free application.
- b. Mark your 32 oz. bottle ‘Application Fluid” or “Soap and Water Solution”.
- c. Fill ¾ full with distilled or reverse osmoses (RO) water.
- d. Add 5-7 drops of baby shampoo. **Do not shake!** Gently swirl it around to mix in the shampoo and water. Baby shampoo is made to be non-foaming. This is important for achieving a perfect application. Shaking the solution or using too much shampoo will result in bubbles which ultimately end up under the film which then show up as defects.
  - i. Too much shampoo results in longer drying time and lower ultimate adhesion.
  - ii. Do not use commercially available application fluids like Rapid Tac or Splash. These fluids are fine for widow graphics but are not compatible for high quality optical clarity and will cause hazing.

**A clean window is essential for aesthetic and functional reasons. Residues from some cleaning products can create hazing and interfere with film adhesion. Here's how to achieve a spotless, residue free glass surface:**

## 2. Glass Surface preparation:

- a. If this is a new window skip to step (b), If the window has a previous protection film:
  - i. Use sharp pointed tool to get under the film edge and peel it back upon itself. If the film is torn and cut it may not come off in one piece.
  - ii. Spray with application solution and then use a razor scraper to remove any residual adhesive residue or built up hard dirt.
- b. Spray the window with the 70% alcohol-water solution wash window well using the firm squeegee to remove the dirt with the alcohol solution.
- c. Spray a 2<sup>nd</sup> time with the application solution and use the rubber edged squeegee this time to remove the solution.
- d. If silicone or another oil based lubricant was use to install the new window, it will require an extra cleaning step with a strong solvent to remove the silicone, followed by multiple applications of the alcohol-water mix to remove the solvent. Test adhesion to insure all the silicone was removed and you are getting a good bond to the window.

## 3. Wet Application Process:

- a. Once the window is free of dirt, oil, lint, dust, etc. it's now time to apply the Window Protection SAG 175 or SAG 53 film.
- b. It is a good idea to work in a controlled, clean and dust free, environment if possible.
- c. Sometimes it's tricky removing a clear film liner from the ultra-clear SAG Window Film face and adhesive. We suggest you use the masking tape to apply a tab on the corner of the face and at 90° to the same corner of the liner (fig. 2). This makes peeling the liner easy without causing a fold or wrinkle.

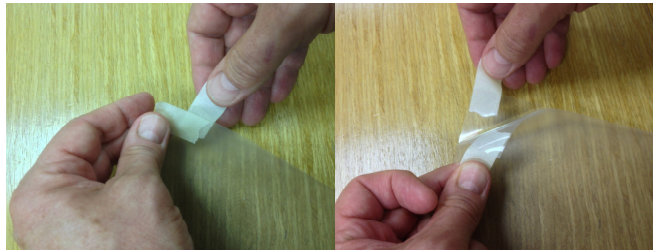


Figure 2

Figure 3

- d. Pull the liner slowly off the face using the tape tab. Spray the adhesive as you are removing the liner. This reduces static and keeps the adhesive from attracting dust.
- e. Spray the window liberally with the application fluid.
- f. Wet your fingers and 'float' the SAG film, adhesive side to the glass, onto the wet window.
  - i. Slightly bow the SAG film so your first touch is in the middle of the film and allow the film to flatten out onto the window (Fig. 4). This helps remove any bubbles that may have occurred during the spraying process.
  - ii. You can move the film around a little to position it perfectly in the center of the window, keeping it 1/8<sup>th</sup> inch away from all the rubber edge seals.



Figure 4

- g. Lightly spray the film on the window with the soap solution just prior to squeegeeing. This allows the squeegee to slide freely across the film.
- h. With one hand holding the SAG film in place on the window use the stiff rubber squeegee to apply firm pressure across the top ½ - 1" of the film. This step is to start removing the fluid from under the film and causing the pressure sensitive adhesive to begin to bond to the window (Fig. 5).
- i. Now, while still holding the film in place on the window, start from the middle, apply squeegee pressure and push the fluid out the edges in overlapping sections from the first application line, first to the left then to the right. Continue alternating left / right, working your way down the film until all the fluid has been removed.

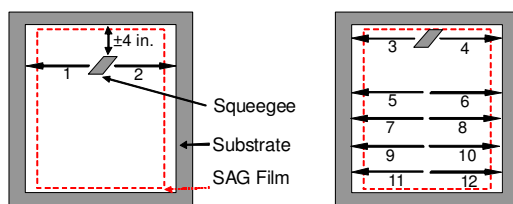


Figure 5

- j. One final squeegee around all the edges to make sure all the fluid is out.
- k. Using the lint free paper towels, remove any application fluid still on the window and around the window frame.
- l. Inspect the application. Any trapped dirt or bubbles will ultimately result in a visual defect, if present:
  - i. The film can be lifted off the window and the wet application can be repeated.
  - ii. If large particles of dirt are trapped, try to dislodge with spray solution. If this is not possible the film must be discarded, the glass re-cleaned and a fresh sheet applied.

#### 4. Removal Process:

- a. Use sharp pointed tool to get under the film edge and peel it back upon itself. If the film is torn and cut it may not come off in one piece.
- b. Spray with alcohol-water solution and then use a rigid scraper to remove any residual adhesive residue or build up hard dirt.

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