



Window Films

# Power Windows

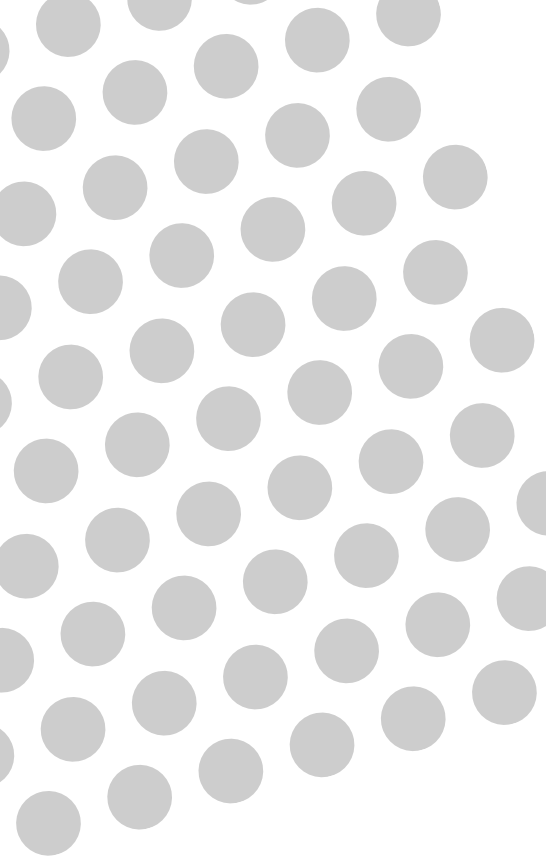
Rewing up revenue with window perf films

BY JUDY BELLAH



**Judy Bellah** is Public Relations Manager for Clear Focus Imaging, Inc. Special thanks to the contributing companies who generously shared their insights. All photos courtesy of Clear Focus, except as noted.

**W**hat began in the early 1990s as a highly specialized niche—pressure-sensitive PVC film perforated, printed and attached to the windows of transit buses—has evolved into a mainstream, multi-million-dollar industry. Window-perf applications range from retail store and commercial posters and building wraps to corporate identity and architectural enhancement. The opportunities for print and wrap shops to rev up their revenue with vehicle window graphics are virtually unlimited. Some of the most common applications include buses and monorails; service, delivery and utility vehicles; emergency vehicles, mobile health-care units and mobile pet clinics; taxis, limos and hotel and airport shuttles; and customized personal vehicles.



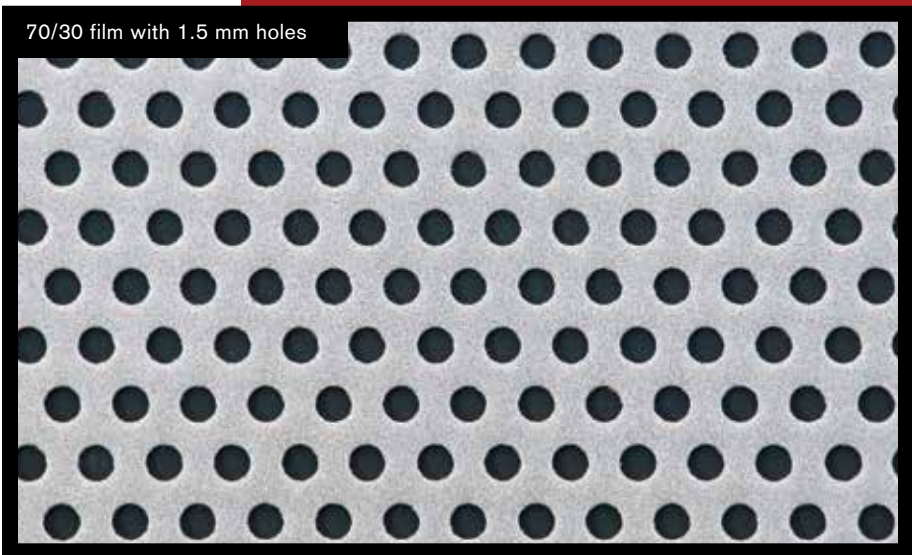
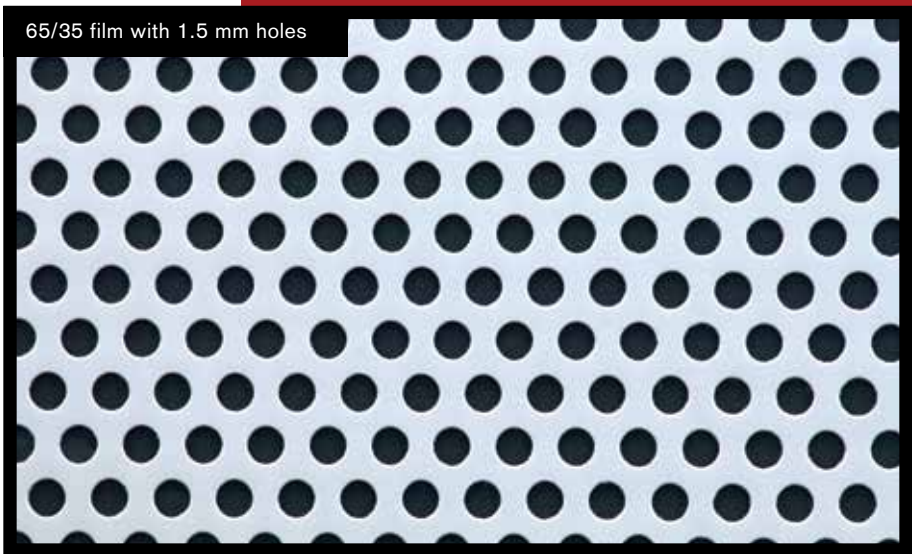
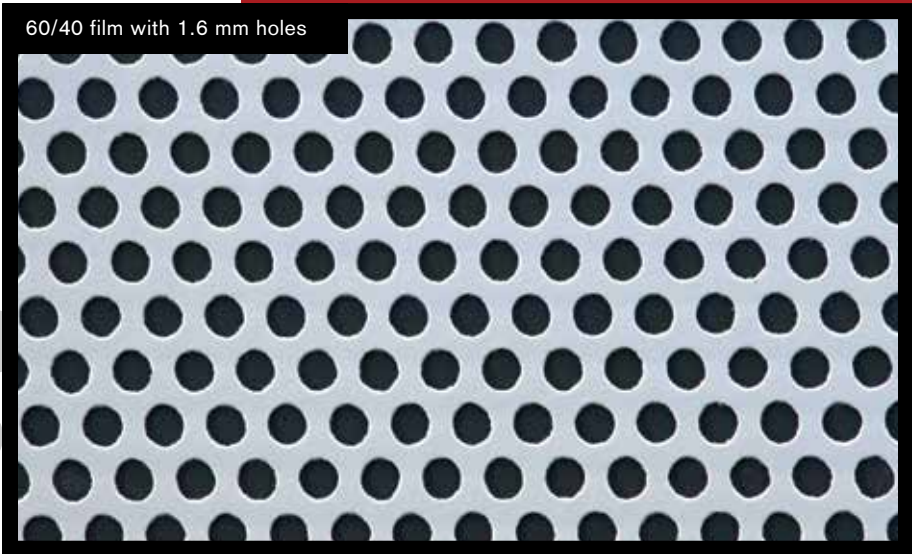
### The Hole Gamut

In addition to brand, window-perf film is usually identified by its perforation pattern, the most common being 50/50, 60/40, 65/35 and 70/30. The first number denotes the percentage of print surface while the second number indicates percentage of open area. Perforation (hole) diameter, which also plays a role in one-way visibility and image quality, ranges from approximately 1.4 mm up to 2 mm.

The closest thing to the “holy grail” of window perf for vehicle graphics is a 50/50 film with 1.5-mm holes. A larger hole diameter—e.g., 2 mm—is more noticeable and can be visually distracting when viewed at close range (think passengers looking through a bus window). These films are more suited for building wraps or rear vehicle windows.

Regulations governing the percentage of visible light transmission (VLT) required on vehicle windows vary by state as well as by vehicle type and window location. The International Window Film Association (IWFA) publishes a list of window-tint rules detailing VLT and other requirements. Visit [www.iwfa.com/NewsEvents/Legislation/StateLawCharts.aspx](http://www.iwfa.com/NewsEvents/Legislation/StateLawCharts.aspx) for more information.

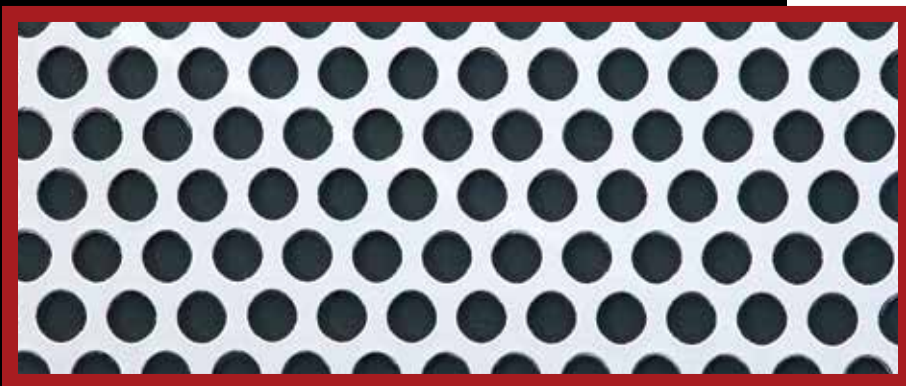
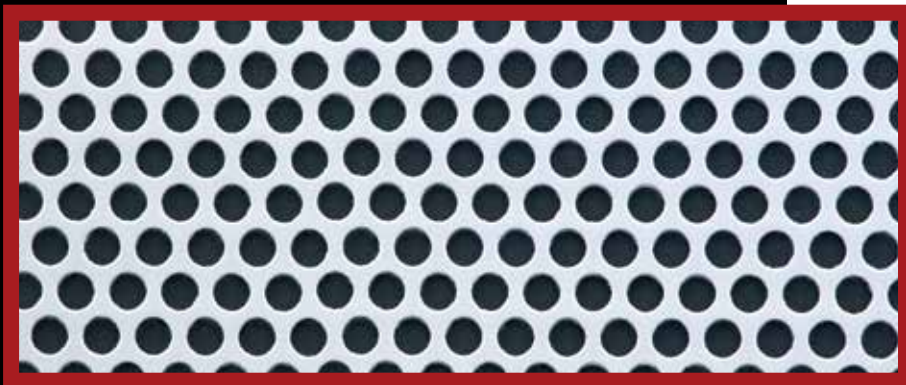
An appealing niche product, perforated retro-reflective window film can create a lustrous visual effect. The use of these films on vehicles is also regulated, so check all relevant laws in advance.



The trade-off of perf patterns such as 60/40, 65/35 or 70/30, which offer more print surface for greater visual impact, is reduced visibility.



To keep moisture and dirt out and to prevent the window perf edges from lifting, Signs Now installer Ulysses Vazquez attaches a strip of clear double-sided tape before installing the graphic. The tape becomes less visible once the adhesive cures. It's best to hold the film away from the surface and use only the squeegee to make contact with the glass.



Balancing image resolution with one-way visibility, and meeting the VLT requirements of many states, a high-quality 50/50 window perf with 1.5-mm holes is optimal for vehicle window graphics.

### Lighter Side of Art

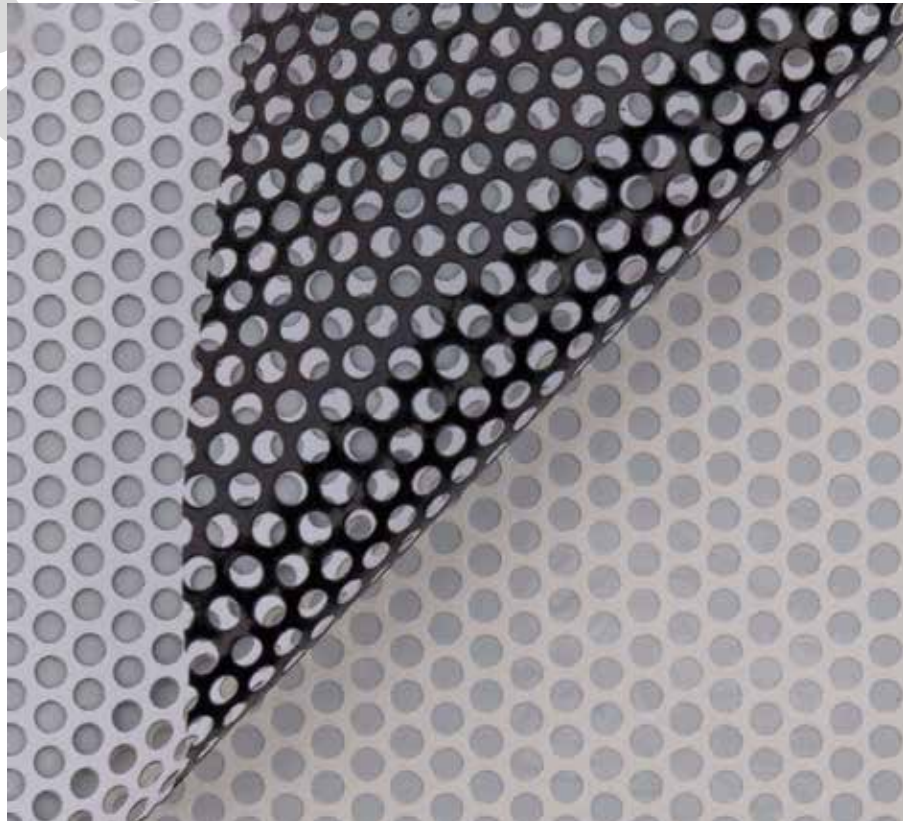
Graphics printed on window perf tend to look faded compared to those printed on solid vinyl because as much as 50 percent of the film has been removed. To compensate for the resulting reduced image reflectivity, image contrast can be increased by 10-20 percent during the design stage. If necessary run a second pass to lay down more ink, but be careful not to oversaturate.

Bright colors provide the best print results with perforated vinyl films. Dark colors should be avoided over large areas for several reasons

- They require more ink coverage, which can amplify any banding or other printing imperfections;
- they absorb more light and may increase heat buildup inside the vehicle; and
- depending on the lighting the viewer may be able to see through the graphics, which is the opposite of the desired effect.

### Liner Compatibility

The lay-flat release liner on perforated vinyl film is designed to catch overspray and help facilitate smooth, even transport of the film through the printer. Most release liners perform well with a wide array of solvent and eco-solvent printers. Un-perforated solid siliconized paper liners, which also perform well with latex printers, are not recommended for UV-cure printers because the UV-cured inks tend to bridge the film's holes. For these printers, choosing window perf with a dual-layer liner construction, which offers greater depth and enhanced ink absorption, is recommended.



Release liners with a dual-layer construction offer greater ink absorption for faster drying. This liner consists of a white PET film that has been laminated to perforated paper.

Graphics printed on a 60/40, 65/35 or 70/30 window perf may pop more, but be sure to check all applicable laws for visibility compliance.



## Hot Tips from Top Shops

For those new to wraps, performing a test prior to actual production can minimize costly errors and uncover any compatibility issues. Below are some tips offered by three shops, each having years of vehicle wrap experience.

### Charity Jackson, Visual Horizons Custom Signs, Modesto, Calif.

- We print our perforated graphics at least one day before installation and wait a day before laminating. If you try to laminate or install without allowing the graphic to fully dry you will have an inky mess on the liner and on your hands.
- We always laminate our perforated film with an optically clear, cast PVC laminate—it adds gloss, protects the finish, keeps dirt and water from settling in the holes and makes installation easier.
- Perforated film is much more flexible and forgiving than it may seem. I typically apply about 6" on one side to hold the graphic in place, and then apply the rest. Tape the graphic in place and then put small pieces of tape along the bottom, where the graphic should line up when applied. When applying the other half of the graphic you can follow the tape lines to ensure straightness. If for some reason it curves down it's fairly easy to peel the graphic back and reapply. We don't premask our perforated film unless it's contour cut.

### Malcolm Gieske, Identity Group, LLC, Slatington, Pa.

- Avoid pre-tack when applying laminated perforated films. It is important not to trap air which may leave behind an unsightly trail of tiny bubbles throughout the application. Hold the film away from the surface and allow only the squeegee to make contact with the glass.
- Trim back the perimeter. Many hinged windows have exposed edges that may leave films exposed for an easy snag while washing or general wear and tear. To avoid peeling edges later, trim the film back a 1/4 inch away from all sides. Many manufacturers suggest adding a thin strip of overlaminate around the film edges for added adhesion.
- Tuck into the lower gasket. On door windows that roll up and down, it is imperative to be sure the film tucks behind the lower gasket. This keeps the edge of the perf from catching when windows go down. Some gaskets are easily removable, which makes the job easy. Others may be simply pulled back while the film is tucked behind. A half inch of film below the gasket top is usually adequate.

### Michael Watson, FASTSIGNS, San Rafael, Calif.

- Clean, clean, clean. Use lint-free cloth to clean windows before applying the graphic.
- Add at least 5" to 6" of bleed to the height of the design for windows with extreme 'up curve' on the ends.
- Do not stretch the vinyl—stretching can cause noticeable distortion in the graphic and the hole pattern.

### Window Perf and Overlam Compatibility

One of the biggest decisions when working with window perf is whether to laminate the graphics. On the plus side, an optically clear overlaminate provides UV protection, moisture resistance, increased image life and an attractive finish. An overlaminate also prevents the holes in the window film from filling with water when it rains or when the vehicle's windows are washed. Laminated graphics are also easier to remove. On the other hand, un-laminated window perf is easier to install, especially when complex curves are involved. Visibility is slightly degraded with laminated graphics—more so if installed on windows with extreme curves.

Laminating is as much an art as a science. If done improperly, streaks, marks and/or wrinkles caused by uneven pressure applied by the laminator rollers or manually when squeegeeing can occur, yet these issues may be difficult to see until after the graphic is installed. To prevent such lamination problems, there must be proper tension on the laminator unwind/rewind rollers so that neither the overlaminate nor the window film is stretched during the lamination process. Uneven areas on the laminator rollers (caused by bowing of the nip rollers) can result in visible flaws.

If laminating, choose an optically clear, conformable, cast PVC overlam that maintains safe visibility and is rated to last the life of the graphic. New, thinner cast PVC overlam films entering the market may be worth a test drive. To keep moisture and dirt out and to prevent the film edges from lifting, use a clear double-sided tape designed for vehicle wraps, a liquid edge sealer, or trim back the edges slightly and encapsulate them using a narrow strip of clear pressure-sensitive film.

In cases where an overlaminate isn't essential but more gloss is desired, consider a liquid or spray clear coat. Although suitable for small-format, flat-glass applications, polyester overlaminates don't mate well with PVC films and are not recommended for auto window graphics.

Allow the inks sufficient time to dry and outgas before applying an overlam. After lamination, wait at least 12 hours for the overlam's adhesive to bond to the window perf before installing the graphics.




Long lines of text or straight graphics work best along the center of the window where there is less distortion than at the bottom of the window. (photo courtesy of Visual Horizons Custom Signs)



## Amp Up Your Auto Graphics

Vehicle wraps have been around for 20 years, and resources encompassing every phase of production, from design and printing to installation and removal, are widely available at The NBM Show and through trade associations. Wrap academies and certification programs are offered by many printer and substrate manufacturers, and there are lots of YouTube window perf installation videos to be found.

Adding vehicle graphics to your print portfolio could open the door to entirely new markets and revenue streams. The learning curve with window perf isn't that steep, and the potential rewards are high. The use of perforated window films just might help see your company through to new business opportunities and growth. 



Retail Signage



Vehicle Graphics



Building Wraps

## Grow Your Business with Window Graphics

Pioneer and leader in perforated window graphics solutions, CLEAR FOCUS manufactures a complete line of self-adhesive and non-adhesive window films and optically clear overlaminates. Our patented release liners are compatible with UV-cure, solvent, eco-solvent and aqueous inkjet inks, screen printing and thermal transfer. Several HP-approved films are available for latex printing.

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