

Great Expectations

Tips to increase outdoor graphic durability.

BY DAVE KING

When someone asks me about durability, my question back is “With regard to *what*? Physical abrasion? Sunlight and UV exposure? Moisture? Temperature extremes? *What*?” When it comes to large-format graphics, it’s the *application* that determines durability.

For this article, we are going to review products designed for outdoor usage, and, hopefully explore durability issues for each. First, we must start by breaking down the types of inks, and laminates/coatings used to create a durable outdoor print. Then we’ll examine how applications come into play.

INKS AND LAMINATES

If you have a printer that will print ink that was designed for outdoor use, it probably comes with a warranty or a suggested time limit for outdoor use. This is your base time for ultra violet (UV) durability, but (in my opinion) has very little (or in some cases — nothing) to do with physical durability and abrasion issues.

A good example is that a number of printers that can print aqueous-based pigmented UV inks have a very low tolerance for physical durability, but when you laminate the print, the physical durability is very good! Solvent-based inks, on the other hand, bite into vinyl and offer greater outdoor durability, but that durability can also be enhanced with lamination.

Laminates, in most cases, enhance appearance, increase UV resistance, and add to the expected physical durability. The major finish types are gloss (vehicle graphics), luster (wall graphics), matte (P.O.P. and trade show graphics) and floor (heavy texture and very thick film). With the exception of floor laminates and DuPont’s Teflon film, most finishes are available in both solid and liquid forms.



Here is an interior wall wrap. Although UV was of little concern, the main durability issue was from people touching and picking, clothing racks being banged against it, and general retail abuse. (Photo courtesy One Source, New York City)

Solid laminates come in rolls and are applied using a laminator (hot or cold). Liquid laminates are for those shops that run a lot of adhesive-backed vinyl (ABV) film. The cost of the laminates range from 10 cents to more than 85 cents per square foot, and some come with a warranty for more than five years. Now let’s look at substrates and some outdoor applications.

OUTDOOR BANNERS

Let’s start with a simple banner — be it digital or cut vinyl. Vinyl has two major durability issues — UV resistance and physical durability. A banner mounted to an exterior wall suffers from wind abuse. The wind will rub and pull this banner thousands of times per month and basically beat

the banner to death until it eventually fails.

One way to prevent this is to use banner mesh that will allow the wind to pass through. Or, you can use a heavy banner material (16 oz. or greater) and then reinforce the edges and install grommets (with teeth). Make sure that each point of the banner is secured to the wall and that the banner is pulled tight so there is no play.

If the banner is to be hung between two structures, make sure you run a steel cable between the two structures (both top and bottom) and then hang the banner from the steel cables. This way the steel cable will take most of the abuse, and the banner will be supported every two feet along the top and bottom.

Again, banner mesh is good, but the sun



can wash out mesh banner, so wind slits in a solid banner are more realistic. Make sure you punch the ends of the cuts in the slits so the wind slits will not keep ripping the banner. If you follow these few steps you could double the life of the banner and keep your customer very happy.

WORKING WITH ABV

The next major product is ABV film, commonly used for outdoor applications. You will find ABV on just about everything, but common outdoor applications include walls, floors, windows, backlits and, of course, vehicle graphics.

Lets start with wall graphics. Some wall graphics are beyond the human touch-zone so the only major issue is UV resistance. But what do you do when the wall graphic is on a busy sidewalk in New York City, and every hour 2,300 people pass by your wall?

Most human-inflicted damage done to wall graphics is peeling. To prevent this, make sure the wall is prepared properly, painted with a quality high-gloss enamel paint. Next, use a thin (2 mil) vinyl with a good (1 mil) laminate. This makes the graphics more difficult to peel off. If the wall is to be removed, like barricades, then use a vinyl with a permanent adhesive so the vinyl will only come off in fingernail sizes. If graffiti is the issue, use DuPont Teflon 1-mil laminate on a 2-mil film with a permanent adhesive.

Next is floor graphics. These are very durable in nature, mainly because the heavy over laminate is designed to accept foot traffic. This laminate cannot be overlapped, so you must butt the seams. This graphic is stiff, and will not conform to anything but a flat surface.

Window graphics is a growing market,

The true test of durability is snow, cold, rock salt and general bad conditions. The Rover after I ran it by a yellow pole. See how the vinyl is still in great shape? The yellow paint came off with a little solvent, but the dents took more effort.

but for me, windows are the best *and* the worst surfaces on which to install graphics. First, they are very smooth, great for installing but there is zero tolerance for making a mistake. Every little bubble is there to stay.

Glass will contract and expand with temperature changes more than any other surface, so the vinyl must be designed for glass or you will find the film curling up on the corners and failing. Finally, you can't repaint or skim-coat glass, so you must use great caution in removing the film. Be careful about the adhesive on the film you choose for windows. Permanent adhesive is nearly impossible to remove!



The average vehicle wrap is guaranteed for longer than the paint on the vehicle (five years). However, there are still some durability issues when it comes to window perf.

Backlit graphics have a real durability issue when it comes to UV because the graphic is being hit 24/7 by either sunlight or UV from the lighting in the lightbox. Most manufactures of window/backlit graphics will not offer a five-year warranty. In most cases, the warranty is for three years.

The way I do backlits is to reverse-print my graphics onto a clear vinyl film (as a mirror image) with a permanent adhesive. Then I'll laminate it with a five-year UV laminate and mount this to the second surface of 3/16" UV Lexan (not cheap stuff) and then coat the back of the clear image with a white translucent vinyl.

What you have is a *very* solid UV filter on the front side of the film with the 3/16" UV Lexan, and on the back side you have used the five-year UV laminate to protect the image from the light bulbs. In most cases, I find these light box graphics last more than five years without any problem. We use a direct print system to ensure the density of ink on the film so we have very solid blacks and all the colors are vibrant. To make this work we calibrated our film on a 5000k light table, so when you get the film it looks dark, but once it is installed is perfect.

Outdoor Durability



Commercial trucks are set high off the ground, so the graphics are well protected from the road rocks, and general abuse. However, most truck owners will not bother keeping the vehicle waxed.



Passenger cars, because they are lower to the ground, are subject to more rock, salt and road debris. And the fuel cap always seems to be smack-dab in the middle of your graphic.



This signage was back-printed onto 3/16" Lexan and is located at Boston's Fenway Park where thousands of people touch, but cannot pick at, the graphics.

VEHICLE GRAPHICS

The average vehicle wrap is guaranteed for longer than the paint on the vehicle (five years). However there are still some durability issues with vehicle wraps. Most people who purchase a vehicle wrap are told that the graphics are guaranteed for five years — but the five years covers the film on the body of the car while the window film is generally only covered for one year. And in my experience, a lot of vehicle window film will fail within that first year.

So, what does durability mean to you now? Well, how long do you want it to look good?

And, equally important, how much are you willing to pay for the extra time? The shorter the time, the less you should pay for the film, but as you know, installation costs the same (per vehicle) regardless of the film type.

Most vehicle graphics are expected to last the full term of the warranty and most wraps are guaranteed for five years (check with your manufacturer for specific warranties). Personally, I believe that a vehicle wrap should look great for four years and will generally start to look old in the fifth year — but this requires a little maintenance.

A wrapped vehicle should not be treated much different than a standard vehicle. If you wash the vehicle



Here is a large 30' x 12' banner on the front of the Boston Public Library that was up for two months in very windy area. It's mounted against a very rough-textured building. Proper mounting techniques made the graphic last.

when it gets dirty, and wax it once a year, it will look great for many years. But if you only wash it once in a blue moon, well, in a few years it will look very poor.

However, would you wax the side of a 40' tractor trailer? You could, and the graphics would look better if you did, but most truck owners will not go to this extreme.

On smaller vehicles, such as passenger cars or vans, the graphics are generally viewed from a closer distance than a high-sitting fleet truck. The vehicle will (or should) see a car wash on a regular basis, but these vehicles will also see a lot of road abuse (stones, sand, tar, bugs, etc.). Road tar and bugs are going to stick to vehicle film just like they stick to paint. However, the DuPont Teflon laminate does a good job of repelling dirt and stains, so this film requires less maintenance.

I believe that protection against stones and rocks is the best durability selling point on vehicle graphics. Very few automotive paints will take a stone-hit without chipping, but vehicle vinyl will generally take hundreds of hits before you will see anything, especially if you're using a good laminate.

A TRUE TESTAMENT

Here is a true testament to the durability of vehicle vinyl. One time I hit a big yellow steel pole in a parking lot with our company's Range Rover (it is covered with graphics). The vehicle lost a tail light, took on a dent and picked up lots of bright yellow paint from the pole — but the vinyl stayed in place! With a little solvent, I was able to get the paint off and now the vinyl looks great. Bumping it out and fixing the tail light took a lot more effort.

I used Avery's MPI1003 with Seal's five-year liquid laminate on my Rover. However, just because I use Avery and Seal liquid does not mean that you cannot expect the same great performance from 3M's 180-10c with 8519 laminate, or products from MACtac or FLEXcon, or any of the other great film and laminate products out there.

I believe that when it comes to vehicle graphic durability, it's the window film that's

the real *Achilles Heel*. The biggest problem is because of the fact that glass expands and contracts. Laminating is problematic because if you use a film laminate, it will expand/contract at different rates than the underlying perf film and eventually show some curling. If you try a liquid laminate (which we've done), the holes in the perf fill with liquid and it's nearly impossible to re-open the holes. Many people print to window perf using solvent-based inks and then mount it directly with no laminate, but when it rains, for some reason it becomes very difficult to see through. Un-laminated window film will eventually crack, get hard and suffer UV deterioration.

The word *durability* means different things to different people. Before you negotiate with your clients you need to have a clear idea of what to expect from your graphics — and what not to expect. My message to you is to work with your film provider to gain a clear understanding of how specific products behave with specific applications. This should help keep you safe from the *free re-do blues*.



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