

# PRACTICAL Sign & Display

R18.33 incl. VAT (SA) / R45.00 Outside SA

4500 Copies / 13 500 Readers

THE JOURNAL FOR THE SIGNAGE, SHOP FITTING &amp; DISPLAY INDUSTRIES

## THE ART OF VEHICLE WRAPPING

By Bob Glenister

### Vinyl selection:

When deciding to wrap a vehicle, two things determine the type of vinyl you should be using. The first criteria and the most determining is; how much deforming are you going to have to do to get the vinyl to follow the shape of the vehicle? For example a flat truck side needs no distortion; however a VW beetle requires a lot of distortion. The second factor is; can you live with shrinkage or is the wrap short term (3 months or less)? Monomeric vinyl's, (cheap) are good for short term applications and where distortion is fairly limited. Remember that all monomers will shrink when exposed to the environment.

For all other jobs, Cast or thin polymeric are the only way to go. Typically cast and polymeric around the 50 to 60 micron thickness are the best to work with.

### The next question is protection:

Is the vehicle subject to aggressive washing with abrasive or chemical agents? Contrary to popular belief all digital prints have problems with different solvents. It is a simple fact that some chemicals will remove the print. Clean Green and petrol for example take off all the digital prints that I have ever tested. The problem here is that you have no way of knowing what chemicals and abrasives the print will be exposed to in the future. Make sure the customer understands the risks, alleviating any arguments later.

Will the print be exposed to mechanical stress? Exposure to sandy or dusty conditions and low trees are good examples of mechanical stress. Once you have determined this, you will need to advise the customers on their choices and the relative risks.

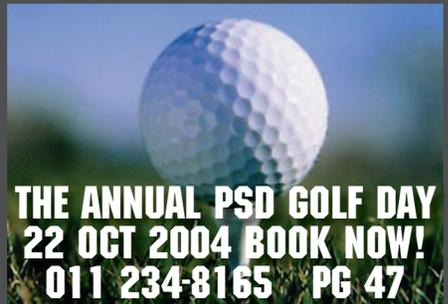
There are four levels of protection that you can supply to your customer.

**1. Highest Risk:** - zero protection; make sure the customer is fully aware that you cannot in all fairness be expected to warrant the print from chemical or abrasive attack and that they are on their own. If possible get the customers signature to this effect.

**2. High Risk:** - wax protection, there are many good waxes on the market that afford a fair amount of protection. We start with simple cheap paraffin waxes (common floor polish) to very hard waxes like DuPont's DRN 916, which is a synthetic wax, derived from Castor Oil. As a general rule paraffin waxes are fairly weak and can be removed very easily with basic solvents. Of the natural waxes Carnauba offers the best protection and is not easily removed, it is however fairly expensive.

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LAMINATING INNOVATORS NOT IMMITATORS

# THE ART OF VEHICLE WRAPPING

## CONTINUED FROM THE COVER...

By Bob Glenister

Another issue is the solvent used to dissolve the wax might just attack the ink binder on your digital print and you might just be protecting white vinyl. A hot wax applicator, that dissolves the wax without solvents, is probably the best way to go, but unless you have one, you will be better off considering options 3 and 4.

I am in the process of still investigating waxes and will publish the results to our web site.

A very effective short term protection is spray on furniture polish. This makes your life easy for application (The squeegee just slides over the print) and also prevents damage from basic solvents and light mechanical damage.

**3. Low Risk, liquid laminates.** This is basically a clear varnish coating over the print. There are many on the market and standard silk screening clear base is one you have all probably used at one time or another. The move away from solvent-based products has bred a new range of water-based coatings that offer very good protection and flexibility. The problem with water-based coatings is that the surface tension of the vinyl and oily deposits from handling needs removing before the coating will bite.

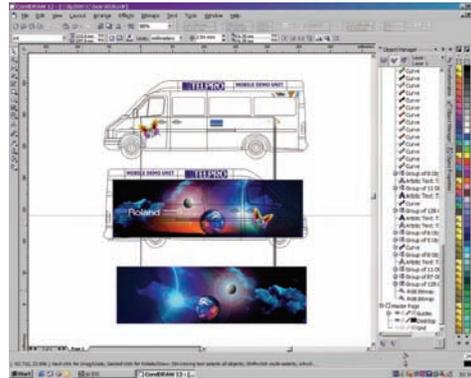
Using soapy water with a Pro pad first scrub the surface of the vinyl (If you are using a lemon based soap, test the print area with the mixture. Certain hard solvent inks do not like lemon juice (Acetic Acid) this is normally very obvious on the yellows)

Now apply your clear coating either using an enamel roller or a Pro pad. Do not worry about bubbles as you will remove these with the Heat gun, by simply holding the heat gun about 500mm from the surface, you will witness a fantastic effect as the bubbles pop and the surface achieves a beautiful smooth finish. Be careful not to dry the surface of the coating with the heat gun as this will "skin" the product and prevent the inner layer from drying. Alternative methods of application are obviously spraying, screening or using a roll to roll varnish applicator (liquid laminator)

**4. Lowest risk, clear laminate films.** There are hundreds of films available that will afford very good protection from both solvent and mechanical stress. Remember, if you are wrapping a vehicle that has aggressive curves, to use a cast or thin polymeric PVC clear film as your over-laminate. Here obviously a laminator is an advantage but if the panels are less

than 3 by 1.2m you can easily laminate the panels by hand. (I will post this technique on our web site for those who are interested.)

So we now have decided on our vinyl and the protection system we are going to use. Let's get on with the design.



If you have the design of the vehicle on a digital library, simply call it up and start planning your layout on the screen. If not, scan in the drawing, as supplied by most reputable car manufacturers on the back of their brochure, and use it as a background to apply your layout to. (Useful friends here are car sales people, as they can source the drawings for you and again they are a useful source of customers needing vehicle wrapping.)

Please remember that your RIP software is not magic and if you are going to expect it to enlarge an image 500 times it needs a lot of detail to be able to do this accurately and smoothly. I would recommend that you should never work with a drawing less than 10 times that of the final vehicle size. (1000% enlargement). At this size you should be working with a minimum resolution of 300 dpi. Obviously the larger your image is the less pixelisation of your final image will occur.

Never and I mean never, increase the size of your bitmap images in your application, your customer will be totally unimpressed with the mess you will print. You can decrease the size of an image, but remember to increase the pixel count proportionally when you do this. For example a 200mm 300 dpi image can be reduced to 100mm by 600dpi without any problems occurring. However never try increasing the size. This is something only RIP software packages are capable of doing effectively.

If your customer gives you an extremely pixelated piece of artwork an effective method in Photo-Shop is to increase the pixel count, but to keep the image size

### Tools you will need:

- Roll of masking tape 12mm wide.
- "Fart Tool" - sharp tool for releasing trapped air.
- Good sharp knife or scalpel.
- Heat gun preferably with variable heat setting not stepped.
- Soft, lint free cloth.
- Fine mist spray bottle.
- Cotton gloves.
- Scissors.
- Various squeegees.
- Scaled vehicle drawing either a hard copy that can be scanned into computer or a digital image.
- Design software for doing layout, a good combination here is Corel Draw and Photoshop.
- Tape measure.
- Rip Software that has a facility to control tiling individually.
- Special tools for removing vehicle trim. This varies from manufacturer to manufacturer. (A useful friend to have is a Panel Beater, as they will be able to advise how different manufacturers apply their trim, furthermore they are a great source of potential clients for vehicle wrapping, if you simply offer them a commission on each referral).
- Spare plastic clips used to fasten trim (for the particular vehicle you are wrapping.) One or two always break when removing the trim, and there is nothing worse than giving a customer a vehicle that is beautifully wrapped but half the trim is falling off.



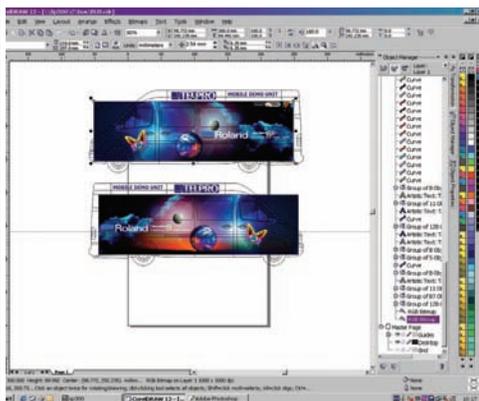
the same. This has the effect of making the pixel steps much smaller so not as obvious once printed full size. You may need to apply the UN-sharpen mask after doing this. Do all of these effects with caution as the final result when blown up can be a disaster. If you are unsure of the result, do a test print and evaluate if it's the effect you are looking for.

I once had a customer who supplied me with 600 dpi artwork, in my innocence believed I had good artwork to work with. What transpired however was that the customer was simply taking a 72 DPI image from his digital camera and applying a pixel count increase in Photo-Shop. All that happened was that details ended up blurred. Remember if 5 pixels define an original detail there is no science or mystical method that can create 20 pixels (at the original size) that make the detail clearer. The more detail in the original art work the more detail in the final print no matter what size you RIP it to, it's really that simple. If you are unsure simply zoom into a detail area and look at the detail. If the detail seems ill defined, you can bet your bottom dollar that it's going to look that bad when ripping to the final size.



I would recommend that all bitmap work be done first in a raster package such as Photo-Shop. Thereafter take the bitmaps (this includes jpeg, tiff, bmp etc) to Corel Draw, Adobe Illustrator, or Freehand and place the text or Vector images onto the graphics. Never place text or vector images onto your drawing using Photo-Shop, you will be very disappointed with the edge pixelisation when you blow the image to full size.

Ok you have laid your graphics on the vehicle and you are ready to send it to your large format printer.



The first thing you now need to do is to determine the scale you need to work at and secondly where you are going to join the vinyl on the vehicle. So get your tape measure out and measure an easy to identify part on the car that can be related to your drawing.

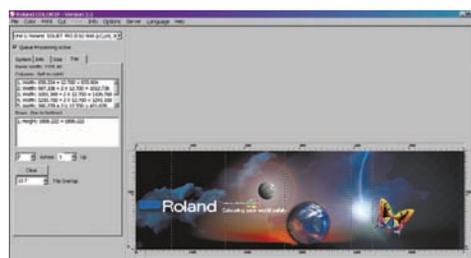
Remember to compensate for the curvature of the vehicle. Now in your vector based drawing, determine the size of the scaled part. For example in reality the door from top to bottom is 1232mm, in your scaled drawing however it is 134 mm. What is the scale to apply (1232 divided by 134) this gives us 9.1940 as our scale factor or 919.40 % I would be wary at this size and I would print at least a small critical part of the layout to see what the final product looked like.

Do one other check measurement on the vehicle, like the overall length, to see if the final layout is going to fit? As a general rule I always want my final print to be at least 5% longer than my measurement as this will allow for curvatures and bumps that I have not allowed for. If you are doing a corrugated vehicle this needs to be at least 15%. It is better in this case to get an assistant to help you to push the tape measure into each corrugation so you know exactly how long the vinyl needs to be.

Remember all of this resizing I am doing in the RIP software not in the vector-based package!

You are not finished with the tape measure. Measure now the points that you are going to split the vinyl. Vinyl does not come in an infinite width and it would be virtually impossible to apply if it did. Let's say the nose of the vehicle is 1009 long, the drivers' door is 950 long, the centre jamb is 162 long, the rear door is 825mm long and the rear is 1320 long. These are the places I would recommend where you split your prints. Remember with doors to allow at least a 20 mm overlap to bend around to the inside edge of the door.

So again going back to our RIP software we can now place our tiles at exactly the right points on our scaled up drawing. The last panel is a problem because it is wider than our maximum print width; on our 1220 wide vinyl (1098 print width) here we have to decide where the best location for an overlap is. Looking at the vehicle we see that there is rubber expansion joint, 950mm from the back of the passenger door. We can then split the print at this point.



We now have several vertical panels of the following widths. 1009, 950, 162, 825, 950 & 370. I would rip these with at least a 20 mm overlap. Once they

are ripped check in the RIP queue that you are not wasting any vinyl. Before you print these jobs, write down the sizes you have used plus the scaling factor. Remember also to write down all the RIP settings. You do this for two reasons.

1. If you damage a panel while applying you can come back later and reprint the panel.
2. If your customer is in an accident you can reprint the damaged panels. I would hate to have to do a complete re-wrap because I had forgotten to store this data with the customer's job card!

One last panel we need to print separately and that is the petrol cover panel.

### Vehicle preparation:

Do not attempt to vehicle wrap outside. Cold weather, wind and rain will only make you regret you even started the job. Ideally you want to work at about 28 degrees Centigrade in a room that has portable tables that you can place on all four sides of the vehicle. Why so hot Bob? Well vinyl is terrible stuff to work with at cold temperatures and 28 degrees really helps in getting the vinyl to do what you want it to do.

Remove all the trim that is going to interfere with the application of the graphic. Remove also the tail lights, protruding handles etc. You can if you prefer cut the graphic around these objects but it never looks as good as where you have wrapped under trim and into the light fitting openings.

Wash the vehicle thoroughly, using a mixture of 5% alcohol, 5% ether and one teaspoon of soap to 5 litres of warm water. (Please treat all chemicals as dangerous unless proven otherwise.) Clean especially around wheel arches and insides of door faces and under window rubbers (A word of warning, you will be shocked at the amount of dirt build up under the widow rubbers, make sure you wash all this dirt out) You won't have time to do this while you are applying, and you will destroy the ability of the adhesive to adhere. (Yes, you will have to redo the entire panel!) Rinse and dry the vehicle thoroughly, checking for any dirt or other build up of junk. An imperfection unnoticed before you wrap can ruin a perfect wrapping job.

Now tape all your printed panels onto the vehicle using the masking tape. Start from the back and the lowest point on the vehicle. Remember your overlaps should always be higher towards the front and toward the top of the vehicle. This is to prevent damage to your job in the months to come from rain and debris thrown up at high speed at the vehicle. (Remember a fly can stop a train if it's travelling at the right speed!)

Once you are happy with the layout remove all the panels except the rear lowest panel.

First put on your Michael Jackson conversion kit; Sorry could not resist this, I mean your cotton gloves.

Using the hinge system place a piece of masking tape straight through the middle of the panel. Fold the bottom of this panel over the centre masking tape hinge and separate the liner from the vinyl. Cut the liner away using a sharp pair of scissors.



I will describe both wet and dry techniques, as I tend to use a combination of both techniques depending on the type of surface I am applying to. (If you are doing this alone then dry application is out of the question.)

#### Wet Technique:

I use this for large and complex surfaces as it greatly assists in getting the large areas out of my way so I can concentrate on the difficult ones.

Spray a very fine mist of water on the adhesive of the vinyl. Do not apply too much as you will begin to curse when you have to get the vinyl to take a shape or into a hollow.

(If you have applied too much water, wipe the surface of the vehicle dry and gently wipe dry the back of the vinyl without disturbing the adhesive. Make sure your cloth is clean and lint free! Now using the heat gun remove any remaining water from the adhesive and the vehicle, gently does it, do not burn the vinyl or your fingers).

Now that you have the right amount of water lay the vinyl on the panel and work the surface with your squeegee so that the vinyl lays flat and you have as few bubbles as you can manage. Do not worry about a few stray bubbles; you can remove them later with the "Fart Tool".

You will find that the vinyl tends to pucker around the complex curves do not worry just get it as smooth as possible, this is where the water really helps. Now, holding the leading edge, using the heat gun, apply heat just behind the point that the ruffles start. Pulling gently on the leading edge, so that the vinyl begins to stretch, work the ruffles out towards the edge, moving the heat source so that it always focus's on the beginning of the ruffle. The first time you do this you will be amazed at how easy it really is!



#### Dry Technique:

I use this technique only if I have someone to help me. I also reserve dry application for areas that have hollows. Never try and heat vinyl into a hollow, it will only come and bite you three days later when the customer brings their vehicle back with vinyl that has popped out of the hollows!

So if you have hollows work the dry vinyl into the hollow with your assistant holding the leading edge away from the vehicle. Hollows that end suddenly somewhere on a flat surface will leave a ruffled piece of vinyl. Using heat sparingly, stretch the vinyl into the blind hollow. Do not rely on heat to do this. It is important that the vinyl is stretched into the hole, otherwise it will simply pop out in two to three days time. Remember also to work away from the hollow ending, otherwise you will find yourself with a major air pocket at this point .

A problem you will encounter, is that on the one side of the panel the vinyl goes down great but suddenly on the other side you are left with excess vinyl and the only way to fix it would be to cut a piece out. Before you take out your knife, apply a little heat and pulling the vinyl at right angles to the bulge, stretch the excess vinyl out of the way. If this fails, which 95% of the time shouldn't, then cut the vinyl and overlap it. Remember that the upper side (vertically speaking) should overlap the lower side. Horizontally speaking the front should overlap the rear section.

On doing a door, first complete the flat surfaces, then grab the leading edge and while applying heat stretch the vinyl around the metal edge. Once you have completed the whole door, trim the overlap to within five or eight millimetres of the edge. If you do not do this the inside edge will look fairly rough and you will have enough bunched vinyl for someone to catch and undo all your hard work.

On window rubber trim, cut the vinyl 5 mm longer than needed then using two flat squeegees, one to lift the rubber another to push the vinyl under the rubber.



This will greatly enhance the professional look of your wrap.

Finally do the petrol cap, remove it to do it professionally, I have not found an effective way to do this on the vehicle due to the hinge mechanism always being in the way.

Now is the time to bring out your Fart Tool. Simply walk around the vehicle with a bright light and the heat gun looking for places you left bubbles. Prick these with the Fart tool and apply heat. You will be extremely satisfied as they disappear.

Now replace all the trim and polish the panels. Call your customer and expect a round of applause.



Your first vehicle is not going to be perfect, this I can almost guarantee. By the third vehicle you will be an expert and you will wonder why you always thought this was difficult. If you have your own vehicle that needs decorating I would suggest you do it three times. You will then have earned your Scouts Badge in vehicle wrapping.

Happy Wrapping

**Thanks to Bob Glenister from Telpro  
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article**