WRAP WITH CONFIDENCE.

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AIRELEASE
PREMIUM AIR RELEASE LINER

Vinyl Wrapping System

Application Guide

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1. Storage

- The VWS ranges offer a two-year storage guarantee for materials provided they have been kept at temperatures of +15ºC to +25ºC and at relative humidity of 40 to 60%.
- Avoid direct exposure of the vinyl to high temperatures (near radiators, direct sunlight etc.)
- Any part used rolls should be kept vertical or horizontally hung on racks. Rolls should never be placed on their sides as this could lead to a large matt section appearing in the whole roll.

From time to time rolls may become matt in parts. The softness of the material means that the surface can take on the appearance of the release liner in the next single turn. This is perfectly normal and reversible. The VWS range will regain its glossy appearance once applied to the substrate (car, truck … etc) although the time it takes to regain its original finish will depend on the temperature. In winter it may take several days, or in summer, just a few hours. If a hot air gun is used during application, it could take just a few seconds.

2. Preparation and Cleaning of the Vehicle

To achieve the best result it is essential that careful preparation of the surface is completed before wrapping begins.

It is recommended that the film be applied indoors, in a clean, well lit, dust free environment.

Do not bring the car in from the cold and begin to wrap, it is important that the car is acclimatised to room temperature before beginning to wrap.

- Lights, handles, aerials, trims and any other protruding items should be removed, where possible, before application.
- Car wax and polish residue must be completely removed.
- Newly painted vehicles must be allowed 3 weeks drying time.
- Clean all surfaces thoroughly using a four stage preparation process: -

  (1) Thoroughly wash the surface to remove all dirt either by hand or in an automatic car wash.

  (2) In a warm workshop environment, where the vehicle is at 18°- 24^{0}C clean again with a white spirit/water mix at approximately 10% white spirit to water to remove any surface contamination, wax or silicone etc. Pay particular attention to recess areas when de-greasing and cleaning.

(3) Finally clean the recesses and rebates with 75% isopropyl alcohol to 25% water mixture or methylated spirit. Wipe dry with a lint free cloth before the alcohol/spirit has had an opportunity to evaporate.

(4) To ensure complete drying of the surface before application, a heat gun can be used. If not completely dry any moisture trapped beneath the film could lead to failure.

It is important to pay attention to the edges, particularly around the rubber seals where moisture could be trapped.

The surface should now be properly prepared for application.

Cut a piece of vinyl for the panel about to be wrapped, then clean the panel once more before beginning to wrap. Cleaning the panel once more after cutting the vinyl for each section ensures no dust from cutting the vinyl is on the vehicle panel about to be wrapped. Repeat this for each panel.

3. Application

3.1 Dry Application Method

Dry application is the preferred technique and the only method recommended and warranted by KPMF.

Applications should be performed in clean and dry workshop conditions with the surface allowed to reach the ambient temperature of 20ºC. A cold environment may make the film more brittle and application to a cold substrate will adversely affect the adhesive bonding characteristics by reducing the adhesive tack. An environment that is too warm will also affect the adhesive and could result in it becoming more aggressive with a higher initial tack.

Tools required: -

- Masking tape
- Soft and hard squeegees.
- Scalpel/retractable trimming knife.
- Tape measure.
- Heat gun.
- Cleaning/de-greasing cloths and materials.
- Basic toolkit (for handle/trim removal).
- Rivet brush.
- Cotton wrap gloves.
- Magnets
- Cutting Tape

- For three-dimensional surfaces that require the vinyl to be shaped or moulded around rivet heads, corrugations, welded areas etc. some heat applied by a heat gun may be required.

- The application of the film to a vehicle is best performed by two people. Overall wrapping times can be reduced with the assistance of a third person to remove and replace trims, handles, lights etc. and on larger vehicles when wrapping roofs and 'difficult to get to' places.

- Mask off any areas that will not be wrapped such as trim, lights and door handles (if they have not already been removed). This prevents the film from bonding to these areas during installation and aids easier repositioning.

- Measure and cut the first panel of material, when handling very large pieces of film it might be helpful to install one half at a time. Using a back slitting knife remove half of the liner and finish this half before moving to the next.

- As most films are directional, always make sure to apply with the logos on the liner facing the same way. A rotation of 90 degrees may make the film appear to be a different shade.

- Clean panel as detailed in point 2. Remove the protective release liner at an angle of about 30°- 40° angle immediately prior to application, this ensures there is limited chance of the material picking up dust.

- When working with KPMF's Absolute Matt products, it is recommended that users exercise additional caution to prevent marks on the surface of the film, as the delicate finish of the absolute range can be easily marked if not handled with care and precaution.

- Keeping the material taut by holding both top corners, offer the material up to the panel and taking the predominant swage line work horizontally down the panel using a squeegee in horizontal strokes, when the area below the swage line is complete work horizontally upward. Use as little tension as possible when applying the film.

- Apply broad overlapping horizontal strokes using a soft squeegee to secure the large areas of material, (ignore recesses for the moment).
  The unique adhesive will allow air bubbles to be dispersed easily. If any large bubbles become trapped or a crease appears then warm the vinyl surface, 'tap' the material away from the vehicle and then re-squeegee.

- When wrapping using material produced on Airelease Liner it is essential that the whole surface is thoroughly squeegeed during application, paying particular attention to large areas such as the roof and bonnet. See Point 3.2 for full instructions on applying KPMF VWS with Airelease Liner.

- Always complete each section before beginning to wrap the next section. If material is left on an area without finishing at some point during the wrapping, when completing at a later stage, this could result in noticeable stress marks on the completed wrap.

- Where recesses and stepped changes of section are encountered, the film should be laid or fed into and around these sections applying as little tension as possible (see Point 3.3 on

application into a recess). Use a hard squeegee edge to ensure that the material is well adhered to the internal angles/returns of the recesses. NOTE: If using heat, use only the minimum amount of heat required (35°C - 45°C) to make the film soften/ relax, and work in small areas stretching the vinyl applied to the flat section.

- Finally heat the film again in these areas to 100°C to ensure the adhesive is fully activated and the vinyl is set – this will help achieve ultimate adhesion in these difficult areas.

- For compound curves and complex multi curves, such as the rectangular grooves on panel vans, special techniques must be used. This involves laying a cut section into the groove, the edges of which are then overlapped by the vinyl covering the van side. See section 3.5 for further information

- ***Caution: If using a heat gun, keep it at least 200mm away from the vinyl surface and use broad sweeping movements to heat the vinyl.*** Use only the minimum amount of heat at all times. Overheating the film will contribute to adhesive failure.

- During fitting, care should be taken not to overstretch the film. Minimum tension should be used and it is best to average the 'stretch' over as large an area as possible.

- If the film is being printed, it is suggested that the design is carefully planned to allow for 'stretch' zones around door edges/recesses and for cutting and fitting into recesses.

- The film should not be cut flush to the edges of bonnets, doors boot or panel edges. Instead, the film should be wrapped around the edges by about 6mm to minimise the exposed edges of the vinyl.

- When rubber seals and trim are present and cannot be easily removed, the film should not be cut to the edges of the rubber mouldings, it is important to tuck the material under the edges to eliminate the possibility of exposed edges of the vinyl. This can easily be done using a piece of the release liner with the film removed. Simply fold a small piece in half and tuck it between the seal and body panel. The liner will hold the seal away from the film as you use your squeegee to tuck it in and secure it to the body panel.

- Text can be applied separately after wrapping.

- As with all vinyl, printed materials must be thoroughly dried for a minimum of 24 hours to eliminate the chance of retained solvents affecting the adhesive properties. The use of ICC Profiles is highly recommended to maintain compatibility.

- If overlaminating the printed vinyl please allow a <u>minimum of 48 hours</u> for the inks to cure before lamination.

- Application to materials such as ABS, PP or rubber is not recommended. Do not apply VWS to these surfaces if long-term decoration is required.

- After application, do not clean the vinyl with a solvent-based cleaner. Normal vehicle washing procedures should be used.

- For further advice regarding Airelease application please refer to the following section.

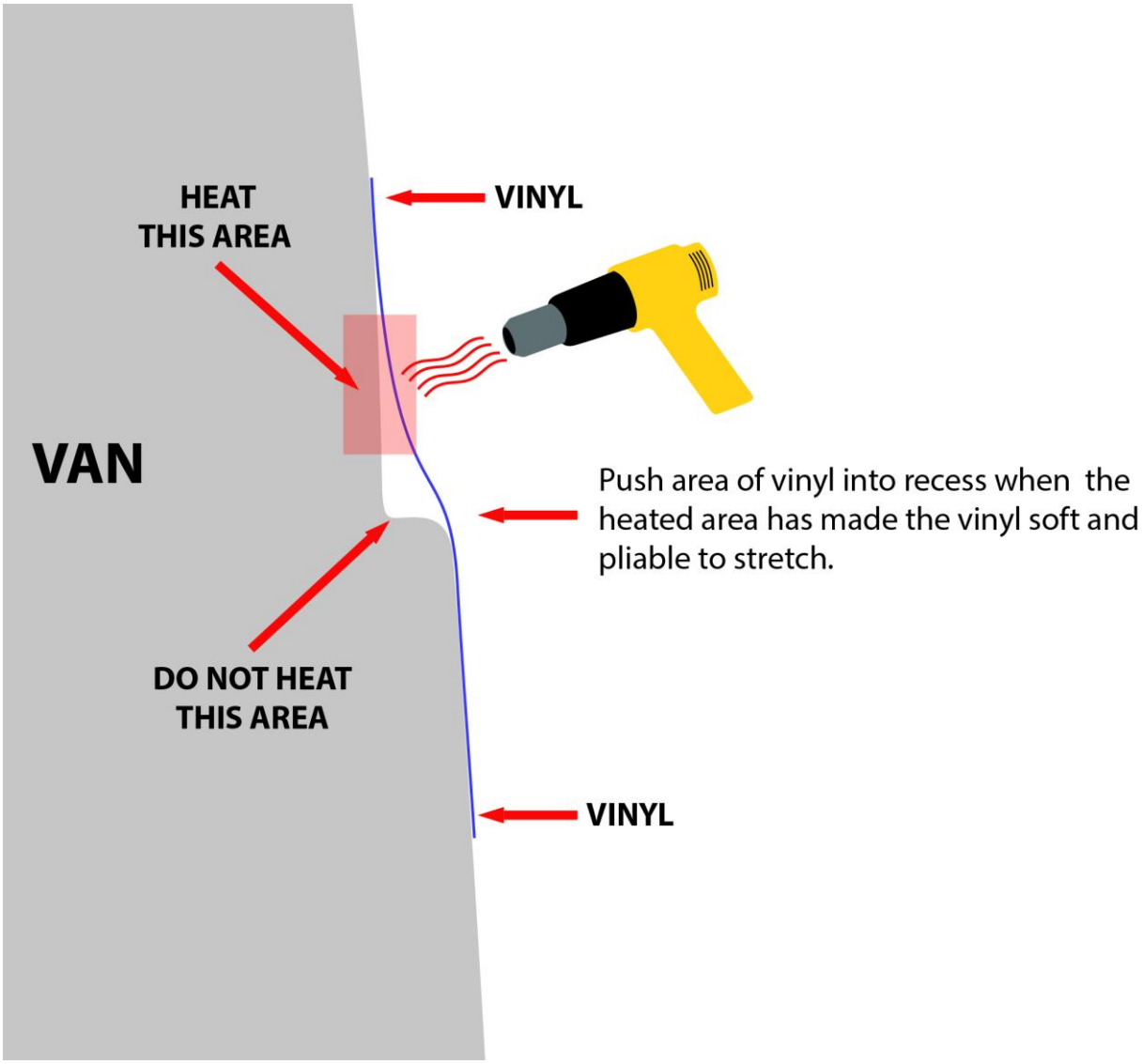
3.2 KPMF AIRELEASE Application

This section is specifically intended for use when applying KPMF VWS product produced on Airelease Liner.

The invisible structured surface of the Airelease Liner provides a reduced initial tack giving a trouble free and effortless application, when using Airelease liner it is essential that the whole surface is thoroughly squeegeed during application to ensure a consistent adhesive bond with the vehicle surface. When completing a full vehicle wrap it is advisable to wrap the roof and bonnet of the vehicle before all other sections.

- The vehicle should be prepared and cleaned as instructed in Section 2.
- Application should be performed in a clean dry workshop at an ambient temperature of 18ºC - 24ºC, but it is important that the vehicle is not heated prior to application.
- When using material with Airelease Liner the dry method application technique should be followed, see Point 3.1.
- The Airelease technology allows ease of positioning and repositioning which must be completed at the time of application. Repositioning of material at a later stage could result in stress marks.
- It is essential that during application the whole surface of the vehicle is thoroughly squeegeed, using light strokes initially with the pressure being increased gradually to remove all the air from under the film. If too much pressure is used this can cause the air channels to close which will diminish the effect of the Airelease technology. Pay particular attention to large areas such as the bonnet or roof, to ensure the adhesive has a complete bond to the surface of the vehicle. If any part of the surface is missed air pockets could develop causing air bubbles to form.
- If bubbles are visible do not push the bubble from the outer edge with a squeegee as this may cause “bruising”.
- If applying into recesses and using heat, this should be done immediately as a delay in heating can cause the film to lift. For extreme recesses it may be necessary to adopt the filleting process as outlined in Point 3.5.
- Following the application the vehicle should be kept at room temperature for as long as possible. It is important that the vehicle is not placed in direct sunlight immediately after the application, this is to reduce the risk of any micro bubbles which may be under the surface expanding causing large air bubbles.

3.3 Application into a recess



To apply vinyl to a recess, the material should be applied on top of the recess without stretching. The material should then be heated above the recess and the material stretched on the flat/straight section. The material should then be fed into the recess without any need to stretch/stress this area. After application the section should be post heated to “set” the vinyl.

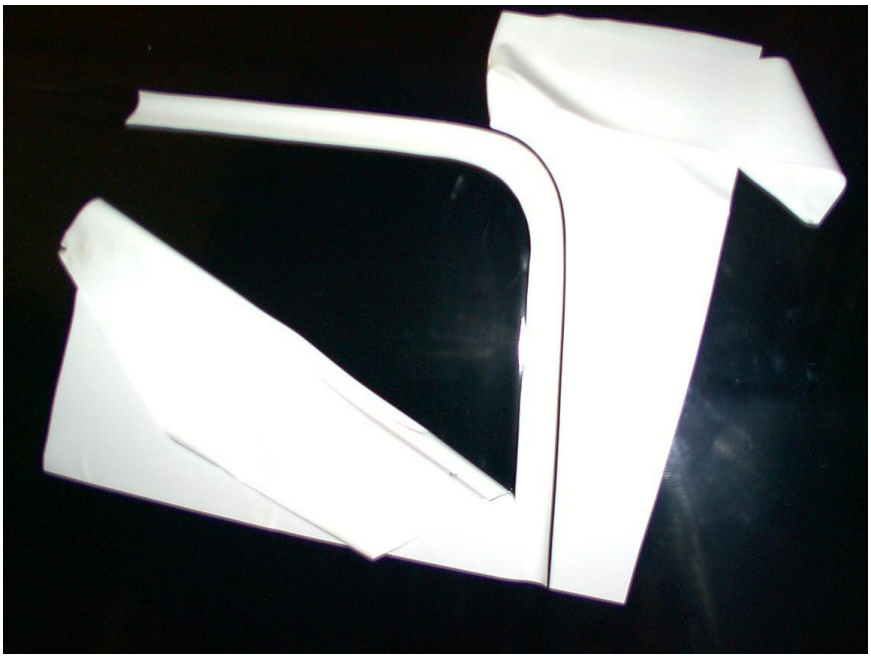
3.4 Relaxing Material before Application

The relaxing technique is fundamentally pre stretching the material.

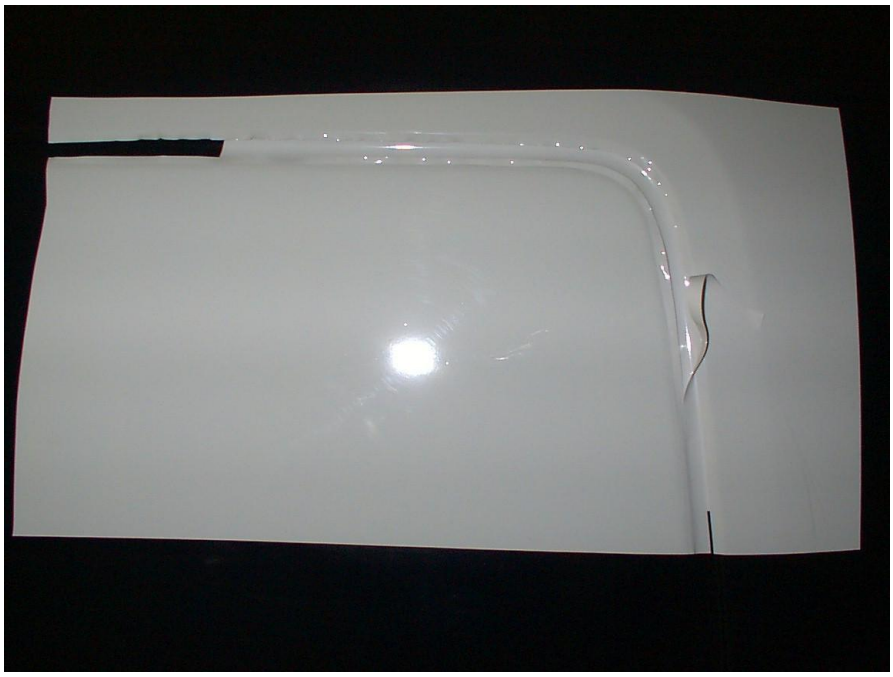
While it is possible to stretch vinyl around a curved surface e.g. a wing mirror, it might be necessary to stretch the material extensively, resulting in a possible failure. This can be avoided by pre stretching.

Pre-stretching is achieved by removing the liner from the film, tacking one edge of the vinyl to a fixed position, heating the film and gently stretching it by hand. Hold the material in the stretched state and allow it to cool. The material should then be placed onto the wing mirror and applied to as much of the centre area as possible, then, whilst holding the edges of material off the vehicle apply heat, the material will contract back allowing you to fold around without creases. This makes the final edges of the material fully contracted and not stretched eliminating the chance of failure.

3.5 Application to Panel Van Recesses



- Apply VWS over the panel and recess. Cut a strip of the film (fillet) wide enough to fit into the recess and internal edges allowing material for trimming. Remove the excess material leaving the fillet. Working from the centre of the recess outwards in both directions, squeegee the vinyl into the base of the recess, around the internal radii and up to the outside edges of the recess. Remove the waste from the panels



- Apply VWS to the flat panels and cut to overlap the edges of the vinyl in the recesses. Use gentle heat if necessary on the corners. This application method hides the joint line from view and ensures that the vinyl remains in the recesses.

- Illustration of a completed recess corner. Some material has been removed from the recess for clarity.

3.6 Wet Application Method

PLEASE NOTE KPMF DO NOT RECOMMEND THE WET APPLICATION METHOD FOR ANY PRODUCTS PRODUCED WITH AIRELEASE LINER.

THE WET APPLICATION METHOD IS HOWEVER THE SUGGESTED APPLICATION METHOD FOR KPMF'S PAINT PROTECTION FILMS (TOP COATED POLYURETHANE) AND HIGH GLOSS PRODUCTS E.G. K88025 HIGH GLOSS BLACK.

- Wet application under normal conditions is not recommended because: -
    - This method of application, combined with the low initial grab of the adhesive, produces very little initial tack.
    - Trapped water will restrict adhesion and makes it very difficult to "work" the material into recesses and around complex shapes.
    - The ultimate adhesion may be compromised, particularly in a cold climate.
- Film applied by wet application will not be warranted with regard to removal.
- If a decision has been made to use the wet application method KPMF would suggest using a mix of 2/3 water and 1/3 isopropanol. Following the application the vehicle must be kept in a heated environment for 24 hours after application and after this period of time the whole vinyl surface should be re-heated with a heat gun and squeegeed firmly. Pay particular attention to recess and swage line areas.

4. Aftercare

Your KPMF wrap is a specialist PVC film which is made up of specialist automotive pigments, resins, plasticisers and various stabiliser packages to ensure the film has maximum durability. The film will provide protection for the underlying paint surface but, is not indestructible and will benefit from good aftercare to ensure it looks its best for a long as possible.

When preparing to clean the car, as with standard car paint, do not spray anything onto the wrap while it is hot. Excessive or over vigorous cleaning can damage the integrity of the film by washing out key components of the matrix, so after application do not clean the vinyl with solvents, solvent based cleaners, oil based cleaners or any abrasive cleaners such as kitchen or bathroom cleaning products. We discourage the use of power washes, steam cleaning and washing systems involving chemicals since all of these can accelerate damage to any vinyl product by leaching out essential components. If you must pressure wash your vehicle, keep the pressure below 140 bar (2,000 psi) and the water temperature below 60°C (140°F). Use a spray nozzle with a 40 degree wide angle spray pattern at 90° to the surface of the wrap and at least 12 inches away from the car edges.

For the best results you should wash your vehicle weekly, or more often if it is exposed to a lot of dirt or pollutants, using a gentle pH neutral automotive car shampoo. Wash with a good

automotive sponge or clean, soft cloth, then after washing, rinse the vehicle with clear water. Water spotting can be minimized by using a chamois leather to remove residual water. Finally dry all surfaces with a clean microfiber cloth. For matt wraps shampoo should be wax and gloss enhancer free. Wash and wax type products can lead to a build-up on the surface of the vinyl that will make it appear cloudy, blotchy or uneven. Stick to a pH neutral car shampoo product for regular washes. The occasional use of an alkaline wash, like Surface Prep Wash can actually be beneficial to matt vinyl as it removes unwanted waxes and oils from the finish.

You can use an automated brushless car wash, but hand washing is safer and yields better results. Car washes that use brushes may be too aggressive, degrading the film and could cause failures such as peeling and lifted edges.

As with the original paint on a vehicle, letting stains remain too long will make them harder to remove and may permanently damage the wrap. Clean bird droppings and difficult stains, which can be highly acidic, as soon as possible by soaking them with hot, soapy water to loosen the contaminants, then rinse completely and dry with a microfiber cloth. For stubborn contaminants, use two parts isopropyl alcohol to one part water.

Avoid cleaning with strong solvents or products containing solvents unless absolutely necessary as they can cause discoloration, bubbling, cracking and other issues. Cleaners containing glycol or butyl acetate should be avoided completely.

Petroleum distillates, should also be avoided, specifically those found in bug and tar removers and similar cleaners as they have the potential to damage vinyl surfaces quickly with minimal exposure.

Always test any solutions on a small area that is not easily noticeable to ensure the cleaner will not harm the wrap.

Clean off fuel spills immediately, then hand wash the affected area. Letting the spill stay on the wrap for too long will degrade the vinyl.

Once cleaned, the surface of a gloss wrap can be polished/protected with a conventional car wax product. If absolutely necessary, scuffmarks should be removed by a gentle rub with “T-Cut” cutting compound, the gloss brought back by re-heating the vinyl followed by the application of a wax based polish. Never use heavy abrasives like cutting polishes, compounds or similar products as they can change the level of gloss on some vinyl or discolour others. This includes the use of polishing tools with abrasive pads.

For a matt wrap the objective is to clean it and keep it as original as possible. That removes any need to purchase waxes or polishes which are usually intended to create a gloss finish. Under no circumstances should a wax of any kind be applied to matt vinyl as it will discolour the material. Traditional car wash shampoo or detail spray may contain slight amounts of waxes, silicones and optical brighteners to help give glossy cars a better shine when cleaned. It is important to choose products that do not have any waxes, silicone or any other glossing agents in them. Only use dedicated matt care products.

Use of a matt liquid paint sealant will effectively protect the surface from staining, fading and etching. This type of product has all the properties of a poly-sealant for gloss finishes, without the resultant gloss finish.

It is best practice to never try and wipe down any surface, but particularly not a matt wrap surface, without some sort of cleaner or lubricant. Having a quick detail spray allows you to clean up soft contaminants like finger prints, fresh bird droppings and dust without risking damage to the surface.

Excessive amounts of time under the sun or other outdoor elements (rain, smog and debris, as well as road pollutants from passing cars) can degrade the wrap on horizontal surfaces which are a magnet for pollutants, the effect of which is then intensified by exposure to UV from the sun. In sunny places park your car in a garage or under a canopy or shelter if possible. If you must park it outside for prolonged periods look for shady parking areas.

Prolonged exposure to acid from pollutants in the air will eventually cause a wrap to discolour. This is typically a result of failure to follow the maintenance suggestions above. If you do notice brown, discoloured or rust coloured areas on your wrap, this means the area of vinyl affected has begun to degrade, a process which is irreversible. Please remove the film from the affected panel to prevent damage to the paint beneath and rewrap it.

5. Removal

Ideally the vehicle should be placed in a warm environment at about 20ºC for at least 2 – 3 hours before attempting removal.

- Heat the vinyl to a temperature of +60ºC to +80ºC using a heat gun.
- Starting at an edge gently peel approximately 10 inches of vinyl away from the edge of the surface, make a cut away from the vehicle and then strip from the vehicle in 10 inch sections. This is best done at a 90-degree angle to minimise any adhesive transfer. Work gradually down each panel heating and peeling as necessary. This method will reduce any chance of paint coming off the vehicle.
  Caution: Do not snatch the material away from the surface or attempt to remove any areas that have not been heated.
- If there are any problems with removal – **STOP** – and contact the VWS supplier for advice on how to proceed.
- **DO NOT** continue to remove the film unless advised to do so by the VWS supplier.
- The VWS supplier cannot be held responsible for inappropriate removal methods or for poor paint/lacquer adhesion to the vehicle bodywork.

KPMF would recommend the use of Flexi Prep Adhesive Remover as an aid with the removal of any adhesive residue remaining following the removal of vinyl.

KPMF would always advise that a trial patch is tested before using Flexi Prep or any other adhesive removers.

6. Caution

- This film is not a cure for rust! It is recommended that it is only fitted to paintwork that is in good condition.
- Whilst the film will cope with most recesses and swage lines, it is possible to over-stretch the film. Very deep/textured recesses (similar to those found on the Mercedes Sprinter, Vito and other panel vans) can still present difficulties.
- Before wrapping vehicles with these types of recesses, please contact your KPMF distributor for specific application advice.
- It is strongly recommended that any printed vinyl is thoroughly dried for a minimum of 24hrs to eliminate solvent retention before being applying to vehicles. Solvent retention will affect the adhesive properties and the removability of the film.
- If laminating the printed vinyl please allow a minimum of 48 hours for the inks to cure before lamination.
- It is essential that the same batch of film is used for the complete application.
- Some products may be susceptible to a matting appearance. This can potentially be removed with minimal application of heat.

7. Warranty

Kay Premium Marking Films are produced under careful quality control and are warranted to be fit for the purpose and free from defect in material and workmanship. Any material shown to be defective to our satisfaction at the point of sale shall be replaced free of charge. Kay Premium Marking Films Limited liability to the purchaser shall in no circumstances exceed the cost of the amount of the defective material supplied. This product has been warranted to provide clean removability, under controlled conditions, up to a period of three years from a range of substrates. Clean removability is deemed with less than 30% adhesive residue when using heat and chemical removal methods. Exceptions to the removal warranty are those applied to the following: pre-existing graphics, paint which is not properly bonded to the substrate and custom paint applications. There is no guarantee made for: ease or speed of graphic removal, removal from improperly cured paint, removal from oxidized or chalked substrates, or from horizontally exposed outdoor applications. Due to the large variety of available paint finishes, it is advisable to fully evaluate small areas particularly after printing prior to complete applications.

8. Material Supply

Supplies of material, training and application advice can be obtained through your local KPMF distributor. Details of all KPMF Distributors and products can be found on our website at www.kpmf.com