

## Marking films - Application guide

The application techniques that we will describe should help users by making their job easier, or by saving them time.

However, we know that all the advice in the world cannot replace the skill and experience of professional users, without whom no high-quality work would be possible.

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## 1. MACtac and the quality

For more than 40 years MACtac has always been an innovative company and has helped its Customers to increase their productivity.

But MACtac is not only focused on new products. Quality and consistency have become the key words for today's industrial world. That is why MACtac has put together continuous quality improvement systems to enable employees to deliver top quality products and top quality service to our Customers.

But Quality is also a question of manufacturing equipment. Here too MACtac has to be considered as an industry leader with the latest investment in manufacturing and finishing equipment at its European site. This new fully automated plant is considered as the jewel of the self-adhesive industry which guarantees quality consistency to satisfy customer demands.

Ultimately, satisfied and successful customers are the measure of MACtac quality. Pursuing this value will continue to drive MACtac into the future.

## 2. Basic tools for vinyl application

pair of scissors  
 cutter  
 ruler  
 pair of cotton gloves or a piece of cotton fabric  
 felt squeegee  
 plastic squeegee  
 masking tape  
 variable-power hot air gun  
 clean room - heated if necessary

## 3. Storage

MACtac provides a two-year storage guarantee for its marking films on condition that they have been kept at temperatures of 15 to 25°C and at humidity of 40 to 60%.



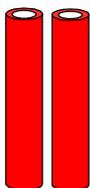
Temperature  
15 – 25°C



Humidity  
40 – 60%

Also avoid directly exposing the vinyl to high temperatures (near radiators, in direct sunlight, etc.)

**OK**



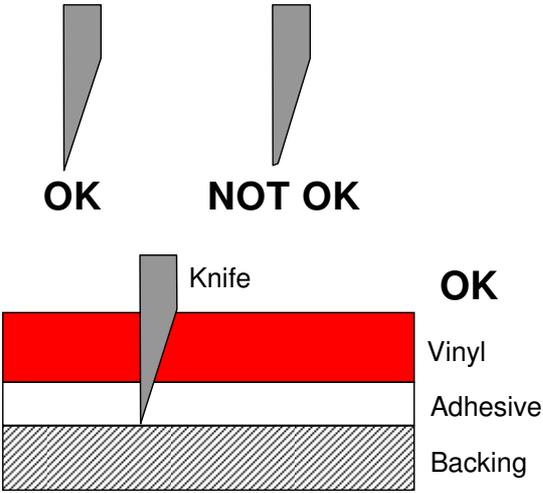
**NOT OK**



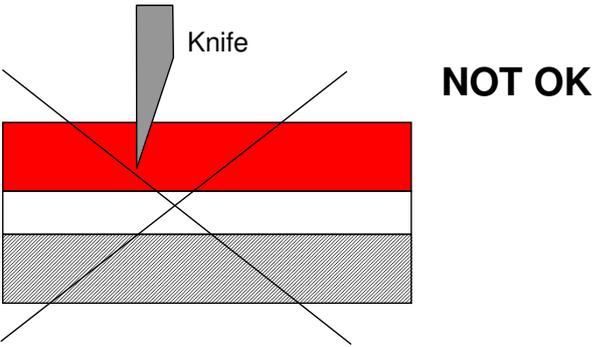
Any part-used rolls should be kept upright or hung on racks.

At no time should they be placed on their sides as this could lead to large areas of matification appearing throughout the roll.

**4. Cutting Process**

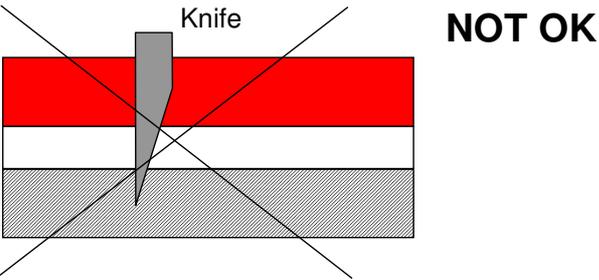


Use a knife with a sharp blade. Blunt or worn knives will result in untidy cuts (known as “jagged edging”).

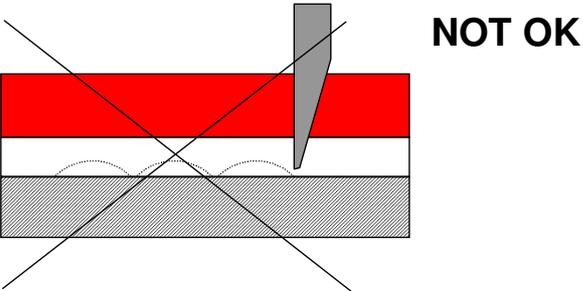


Cut to the correct depth. The knife should cut all the way through the vinyl and the adhesive.

If the cut is not deep enough (the vinyl and/or if the adhesive is not cut all the way through), the letters and logos that you have cut out could be pulled away during stripping.



If cuts are too deep, then the backing could split when the letters or logos are being transferred onto the MACtransfer tape.

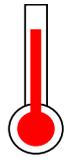


Applying too much pressure when using a blunt knife could result in the knife bouncing off the backing paper, which means that the adhesive will not be cut all the way through.

## 5. Weeding Process



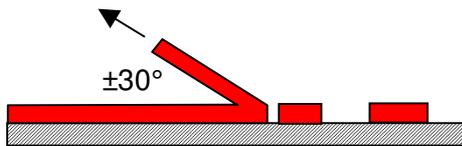
Maximum  
1 hour



Temperature :  
15-23°C  
Max 25°C

MACtac recommends vinyl weeding takes place soon after cutting.

If weeding is delayed too long and if the ambient temperature is too high, the adhesive layer could “reseat” itself and could therefore hamper the ease of weeding.



For best weeding results, use a cleaving angle of  $\pm 30^\circ$  and pull at a steady speed.

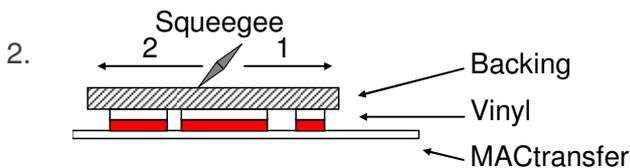
## 6. Application Tape:

The application tape should preferably be laminated using a laminator.

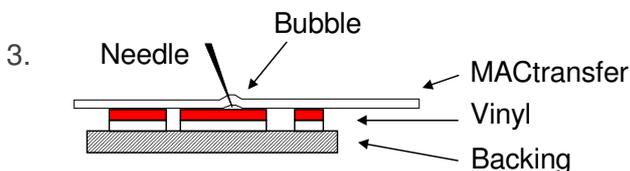
If this is not possible, then use the following procedure:



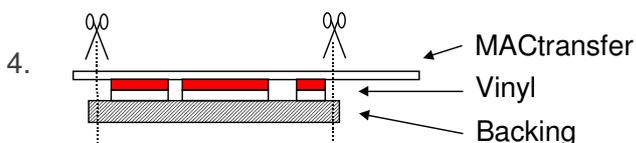
Roll the MACtransfer (=AT) on a table with the adhesive facing upwards.  
The AT dimension has to be bigger than the lettering / logo to be transferred.



Place the lettering / logo on the AT.  
Squeegee the reverse side of the marking film backing with a stiff plastic squeegee, working outwards from the centre.



Turn the layers over and prick any air bubbles trapped between the application tape and the vinyl using a needle or a cutter (bubbles could cause wrinkling when applying the marking film on the substrate).



Cut the AT to the same size as the marking film.

To carry the vinyl with the AT on it to the place where it is to be applied, roll it up with a diameter of at least 5 cm, with the AT facing outwards, or carry it flat.

## 7. Cleaning the application surface

Even if they appear clean, all surfaces should be cleaned using the procedure below:

Clean with soapy water, then rinse with clean water (do not leave any traces of soap on the surface). Clean away any grease using isopropyl alcohol or denatured petrol. Dry the surface using a dry cloth or a clean paper towel which will not leave any small pieces behind, before the isopropyl alcohol or denatured petrol has had a chance to evaporate.

## 8. Marking Films Application Method

A wet method or dry method application technique may be used. The method chosen should suit the size of the decorative feature to be applied and the complexity of the surface to be decorated. Dry application is the most reliable method.

### 8.1 Wet method

This method of application produces very little initial adhesion. This allows the applicator to position the vinyl where required, avoiding air bubbles and folds.

The adhesion will gradually increase after several hours as the water evaporates.

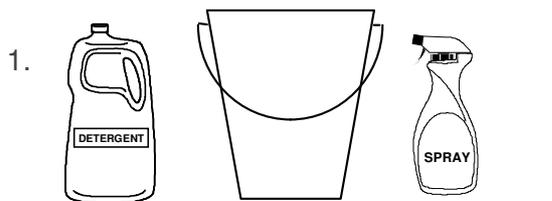
The final adhesion will be reached after 24 or 48 hours.

It is not advisable to apply a marking film using the wet method in temperatures lower than 15°C.

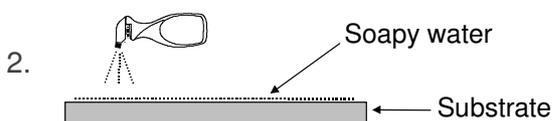
Advantages of the wet method:

Allows the vinyl to be applied to surfaces in high ambient temperatures (>25-30°C).

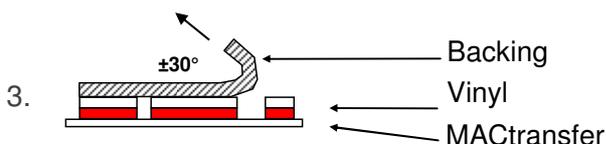
It makes it easier to apply large sections of vinyl on flat or slightly curved surfaces.



Prepare a solution of soapy water (one capful of detergent to 10 litres of water) and pour it into a spray bottle.

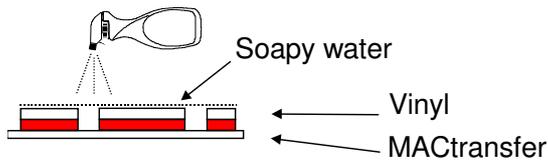


Use the spray bottle to wet the entire substrate surface (do not use a sponge or a cloth as these can leave dust, fluff, etc.).

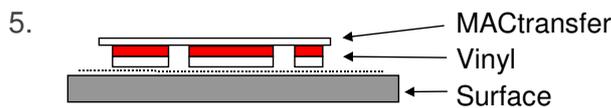


Make sure the adhesive film is flat on a table. Pull the backing off it (and not the reverse) at an angle of 30°.

4.

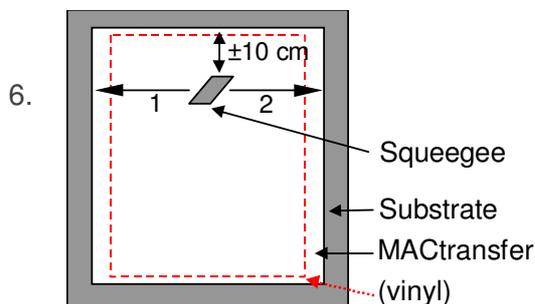


Wet the adhesive all over using a spray bottle.



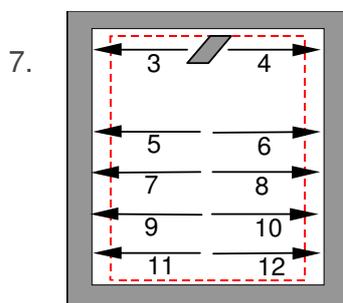
Place the marking film on the wet substrate surface.

If the vinyl does not have any application tape on it, wet the entire surface of the film. This will make it easier to slide the plastic squeegee without scratching the vinyl



Squeegee horizontally, working from the centre outwards to the left and then the right stopping  $\pm 10$  cm from the top edge of the vinyl.

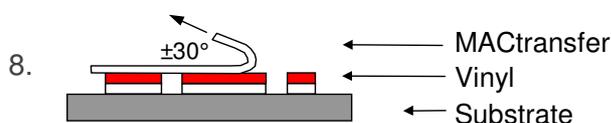
Apply enough pressure to squeeze out any water trapped between the adhesive and the substrate surface.



Squeegee the last 10 cm of the top edge working from the centre outwards, to the left and then the right.

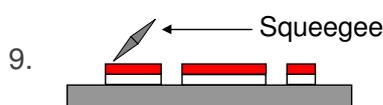
Continue to squeegee horizontally moving from the centre outwards with overlapping movements.

Check that no pockets of water have been trapped. If this is the case, squeegee from the centre to the edge in order to squeeze it out. Wipe the vinyl and the edges.



If the marking film is covered with AT, pull it off at a steady speed, at a cleaving angle of 0 to 30°.

It is advisable to wait between 30 and 90 minutes (depending on the ambient temperature) before removing the AT. It should not be left in contact with the vinyl for more than 24 hours.



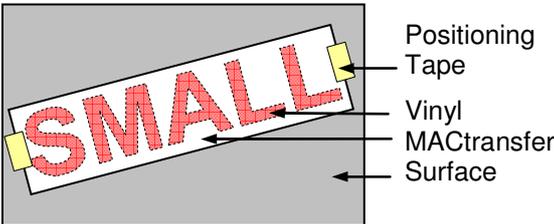
After these 30-90 minutes squeegee the film again, paying particular attention to the edges.

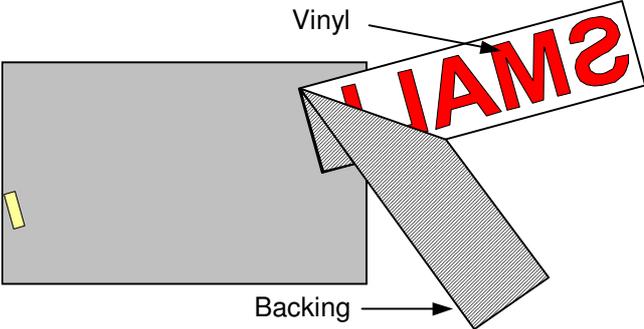
## 8.2. Dry method

Dry application is a safer application method because the marking film reaches its final adhesion quicker than using the wet application method.

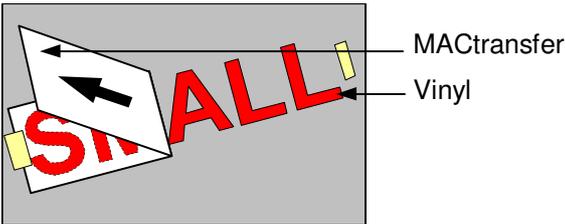
The lowest application temperature for marking films on flat or slightly curved surfaces is 10°C. On three-dimensional surfaces that require the vinyl to be shaped (over rivet heads, corrugations, welded areas, etc.) only MACfleet 6500 or IMAGin JT 5529 P may be used. Their minimum application temperature is also 10°C but require the use of a heat gun.

### 8.2.A. Small surface areas (< 0.5 m<sup>2</sup>)

1. 

Place the application tape on top of the lettering or logo. Position the lettering or the logo **WITHOUT REMOVING THE BACKING**, using positioning tape at each end.
2. 

Cut one edge of the positioning tape. Peel the backing off.
3. 

Position the lettering or the logo once again on the spot marked by the piece of positioning tape. Squeegee quickly and firmly from the centre outwards in overlapping movements.
4. 

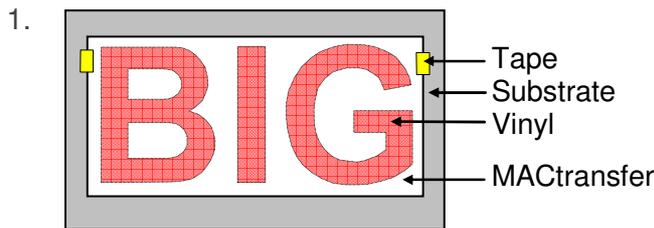
Pull the AT off at steady speed, at a cleaving angle of 0 to 30°. Prick any air bubbles (\*) trapped between the vinyl and the substrate.

(\*) In the event that “tiny bubbles” of air get trapped between the marking film and the substrate surface (bubbles which have a diameter < 2 mm), there is no need to do anything as they will disappear after a few days due to the porosity of the vinyl.

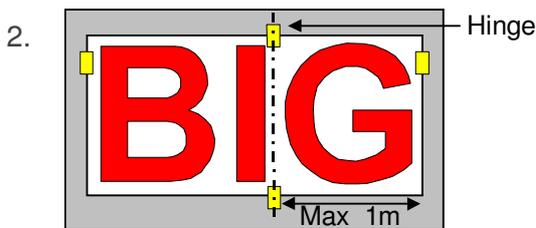
If the bubbles are over 2 mm in diameter, use the following procedure:

- 1 - try to collect the bubbles together without putting the vinyl out of shape.
- 2 - prick the bubble at one end.
- 3- pushing from the side opposite the opening, squeeze the air out through the opening

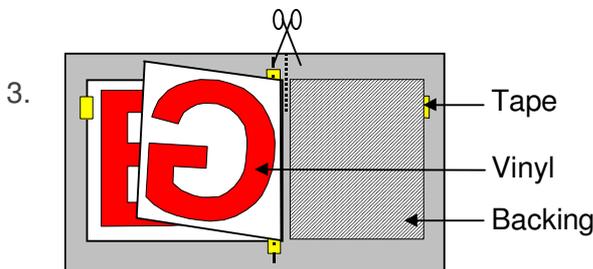
### 8.2.B. Large flat surfaces (>2 m<sup>2</sup>) : hinge method



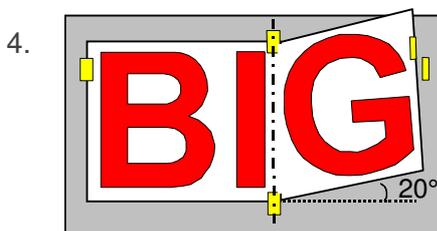
For surfaces of this kind, it is absolutely necessary to apply AT to the lettering or logo. Position the lettering or the logo WITHOUT REMOVING THE BACKING by using a piece of positioning tape at each end.



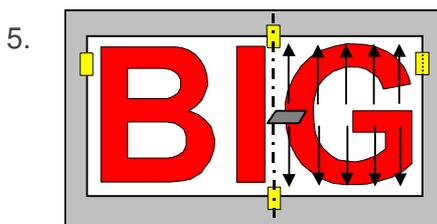
Make a hinge perpendicular to the largest dimension of the letters or logo, no more than 1m away from any one of the edges.



Cut the positioning tape. Fold one half on top of the other. Remove and cut the backing as far as the hinge.

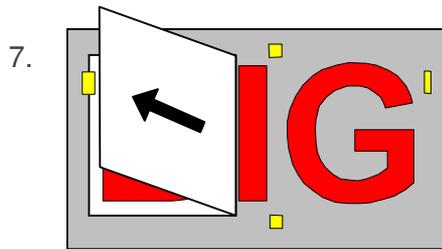


Fold the hinge back making sure that you leave a space between the vinyl and the substrate surface (angle of  $\pm 20^\circ$ ) in order to avoid pre-adhesion.



Squeegee firmly from the centre outwards in overlapping movements.

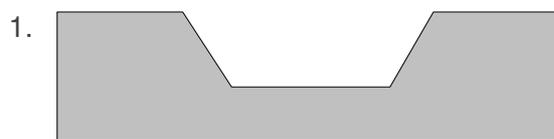
Repeat the same set of actions for the other section of the lettering or logo.



Remove the AT at a steady speed, at a cleaving angle of between 0 and 30°.

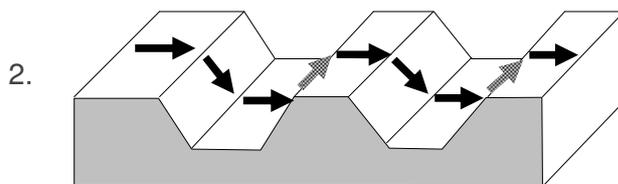
Prick any air bubbles trapped between the vinyl and the substrate and squeegee once more.

### 8.2.C. 2D areas (vinyl can be applied following these surfaces)



The ambient temperature and the angled surface of the object have to be ideally between 18 and 25°C.

Clean the substrate surface and remove any grease using isopropyl alcohol.



Apply the vinyl covered with MACtransfer step by step, following surfaces irregularities.

Remove MACtransfer once finished.

### 8.2.D. Complex curves – 3D areas (vinyl can't follow surfaces irregularities)

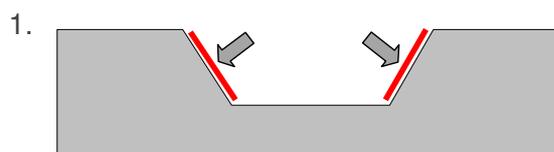


In some case, we need to apply some graphics on complex curves.

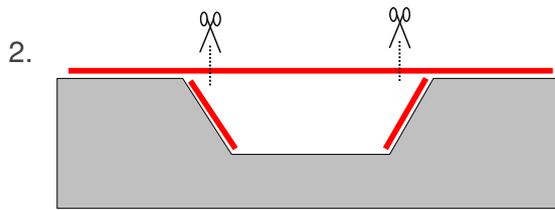
On these difficult surfaces, we can't apply the vinyl following all these complex curves.

We have therefore 2 options :

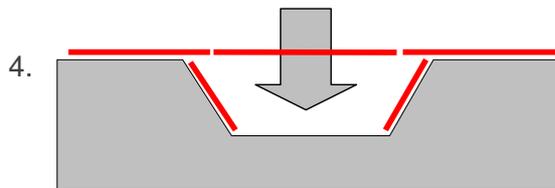
1. Apply the vinyl on the flat area, than stretching it inside the corrugated area. These method is very risky, and the graphic could lift this corrugated area within a few weeks/months.
2. Cutting the vinyl as described here-under :



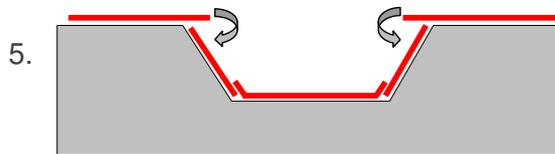
Before applying the graphic, cut a stripe of vinyl (same colour as the one used in the decoration) and apply it without tension inside the corrugation.



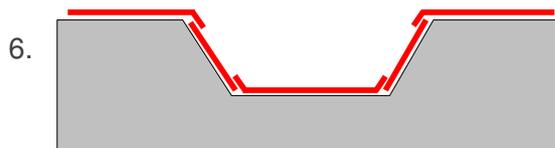
Apply the decoration on the vehicle.  
Cut the film.



Apply the cut vinyl without tension in the corrugation.



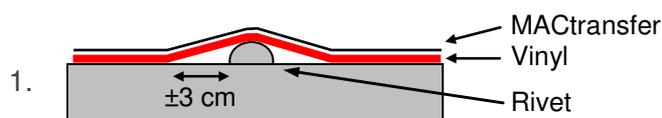
Apply the cut edges.



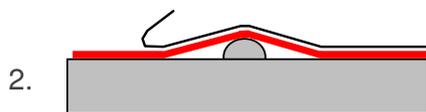
Proceeding in that way assure to the final customer a safe application.  
The small cuts are almost invisible.

### 8.2.E. Rivets

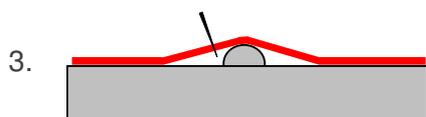
If decorating a vehicle with rivets, only MACal 9800 Pro can be used.



Apply the MACal 9800 Pro using the dry method described earlier, to the whole area of the surface of application, leaving a  $\pm 3$  cm gap between the vinyl and the substrate, around rivets.

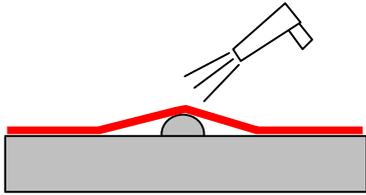


Remove the application tape at a steady speed and a cleaving angle of 0 to 30°.



Collect the bubble around the rivet without putting the vinyl out of shape.  
Prick several holes in the vinyl around the rivet.

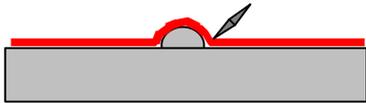
4.



Heat MACal 9800 Pro with a heat gun (at  $\pm 250^{\circ}\text{C}$ ).

Squeeze out any air trapped between the vinyl and the rivet using your finger.

5.



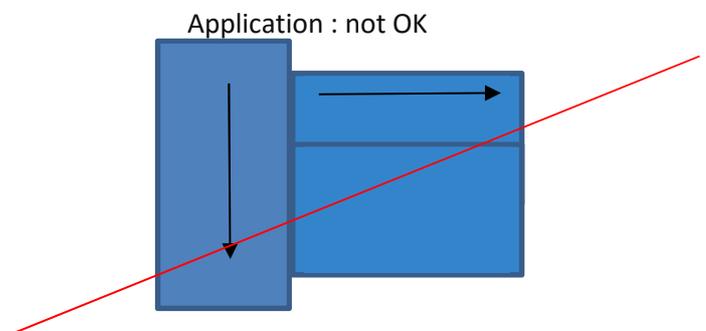
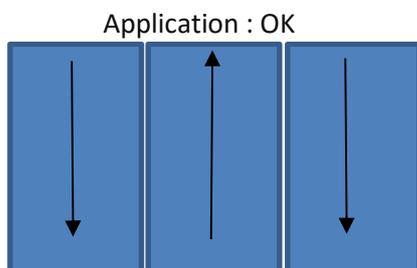
Press the film firmly around the rivet with your finger or a plastic squeegee.

6.

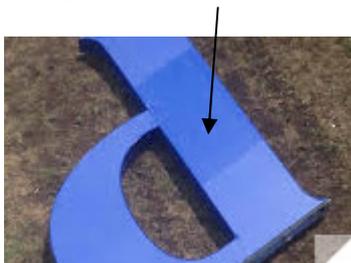
Finish off by stabilising the vinyl with a heat gun (air temperature at  $\pm 650^{\circ}\text{C}$ ).

### 8.3. Transparent, translucent or etched films

For transparent, translucent or etched film like MACcrystal 8400, MACal 9700 & Glass Decor range, the film should always be applied in the same direction, never at  $90^{\circ}$  angle as this could lead to a change in colour (arrows below indicate machine direction in the PSA roll)



In the following picture, one piece of coloured vinyl was applied in the opposite direction leading to a change in colour.



## 9. Vinyl Removal

In the case of short-term advertising campaigns, removable self-adhesive films such as MACal 8900 Pro can be used. These films can be removed without any difficulty at ambient temperature (from 15 to 40°C), without leaving adhesive residue on most common surfaces.

In the case of markings with permanent self-adhesive vinyls, we recommend to remove them with heat :

- Heat the vinyl to a temperature of 70-80°C using a heat gun (air temperature of  $\pm 300^{\circ}\text{C}$ ).
- Peel off the permanent marking film - small pieces at a time.
- Chemical products for easier vinyl removal are also available in shops. Follow the manufacturer's instructions carefully.
- Eventual adhesive residue can be removed with a towel soaked in isopropyl alcohol, denatured petrol or a shop-bought "adhesive remover".