

Practical Information

no. 5, version 2010/05



Self-adhesive films for application on cars

ORAFOL® Europe GmbH

1 Preliminary remarks

Successful vehicle wrapping depends on exact knowledge about the conditions of the car in order to be able to select the right type of self-adhesive film. This requires an answer to the following questions:

- How old is the car or the car paintwork?
- What is the state of repair of the car and in particular its paintwork?
- Are there any rusty spots?
- Is the film to be applied to plastic parts?
- Is the film to be applied to difficult corrugations or rivets?
- How big is the car?
- What are the problem zones?

The varnish of the car must reach the cross cut characteristic 0 (zero). In this case the adhesion between the single varnish layers is higher than the adhesion between the varnish and the ORAFOL® self-adhesive films. Therefore an impairment of the varnish by the adhesive of the ORAFOL® film is excluded.

As soon as these questions are answered, the type of self-adhesive film may be selected:

Calendared and relatively strong films which provide the advantage of being robust and easily removable for car wrappings without "problem zones"

Cast films which can easily be applied in a heat deep-drawing process for car wrappings with "problem zones".

2 How to proceed?

ORAFOL® recommend to use only material with the same batch number for one graphical application. When different batch numbers are used the technician should make tests to find out possible differences in using the films and in the quality of the graphical application.

2.1 Cleaning

Only conventional detergents should be used to clean the surface. It is not allowed to apply detergents that use nanotechnology to produce nanosealing or nanocoating at the surface to be cleaned.

- a) One day before applying the film, the car should be taken to a car wash (using brushes. No manual cleaning.)

- b) Surfaces and edges should be thoroughly checked for remnants of wax or polishes. Any such substances must be removed using industrial cleaners or silicone detergents (Isopropanol alone will not do the trick.)
- c) Deep corrugations have to be baked out at a temperature of 220°C (428°F) max. A layer that may have grown on the varnish has to be removed with isopropanol.
- d) Residual silicone or other residual filling substances in deep corrugations are to be completely removed.
- e) In a next step, Isopropanol should be used to ensure **complete** removal of all remaining detergents. (The use of spirits is not recommended.)
- f) All parts obstructing the application must be dismantled (outside mirrors, door handles, trims etc.).
- g) Check and clean the covered surfaces as describe above (points a) till d))
- h) Make sure the car is completely dry. Remaining humidity especially under rubber seals should be removed by pressurized hot air.

2.2 Application of film

The film is applied in a dry state.

2.2.1 Test application

We urgently recommend carrying out a test after cleaning and before application to check the final adhesion after 24 hours. It is advisable to apply the film also to uncritical surfaces (e.g. window panes) for reasons of comparison.

Repeat the cleaning as described above in case the film sticks to tied and/or air bubbles develop.

The same applies if the adhesion is too weak (e.g. when the vehicle or parts of it were pre-treated with substances using nanosealing/nanocoating or nanotechnology).

In case the test application reveals reduced adhesion to vehicle windows, cleaning with Aceton may help. Please make sure that neither window rubber seals nor painted surfaces or plastic parts get into contact with Aceton as Aceton may damage these parts.

After completion of renewed cleaning, repeat test application as described above.

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2.2.2 Necessary tools

Tools required for applying the film:

- felt squeegee with felt edge
- cutzits or scalpels
- hot-air gun

Basic tools:

- set of Torx screw drivers
- set of hexagon screw drivers
- screw drivers of different sizes and/or ratchet tool set
- universal and pointed pliers
- rubber mallet

2.2.3 Required conditions

- The car must at least have the recommended application temperature.
- Clean, light and dust-free room with rising or assembly platform, if possible
- Electricity supply

2.2.4 Preparation

- Measure car parts and pre-cut film formats generously.
- The films should be trimmed on the car. A width of 152 cm allows applying the film to many car types without disturbing studs or overlappings.
- The cutting must always be done on the clearance edge bordering the part to which the film is to be applied.
- The projecting part of the film (clearance width) is turned into the interior area of the car.
- Do not cut films flush with car edges to avoid shrinking of the films or mechanical wear on the open cutting edge through cleaning brushes, wind etc.
- Apply film also under rubber seals to avoid open edges.
- If it is unavoidable to cut the film on the car surface, apply siliconized crepe or similar material where the cut is to be performed. Lift the film slightly after cutting and remove the crepe material before finally applying the film.

2.2.5 Application method

General remarks

Calendared films must not be deep drawn hot into deep car corrugations. The film has to be

worked or cut over rivets or into recesses like hollow areas or corrugations.

High-duty cast films can be deep-drawn hot into deep car corrugations. They should however be worked or cut into very deep recesses (such as the deep corrugations).

Films with microstructured adhesive (Rapid Air) are suited for even or slightly corrugated areas. For more curved surfaces such as rivets or recesses like corrugations these films have to be worked or cut.

Carbon Structure Cast films have to be worked or cut over rivets or into recesses like hollow areas or corrugations. Because of its surface structure the film must not be stretched too much during the application.

Freshly printed films should be spread out and left to dry for 72 hours before lamination. Please see our practical information for digital printing materials (Download: www.orafol.de).

Application to vehicle windows: Make sure that the application on the window does not impair the driver's vision. Application to a rear window requires the existence of a second outside mirror. Do not cover the window frame or rubber seals. Do not clamp the film between the window frame.

Application of the film

- Position the film to be applied to the car surface and fix it with adhesive tape or remaining film bits.
- Make sure the film rises some 5 cm above the edges of the part to which the film is to be applied.
- Remove the covering paper from the film and stretch the film equally over the part to be wrapped. Apply the film with big swings of a squeegee.
- For rounded surfaces such as wings, the **whole** film should be heated using a hot-air gun.
- Cut and fold edges only after cooling of film.

Important

Any deep-drawn areas, borders and edges should be carefully reheated with a hot-air gun after coating in order to quickly activate the adhesive substance. It is recommended to briefly reheat the film in deep corrugations to a temperature of ca 120°C. In this way the vinyl be-

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comes a stable structure. This temperature will not damage the adhesive substance and the car's paintwork. Specialized shops offer infrared thermometers which allow exact measuring of the underground temperature. Move hot-air gun constantly to avoid damage to the film. Finally the film should be pressed into the corrugations again.

When the re-assembling is finished, reheat all borders, edges and corrugations again with a hot-air gun to 150°C. Remaining tiny air bubbles under the film will diffuse through the film within a few days depending on the ambient temperature. Only larger bubbles should be slightly punctured by a pin or pointed scalpel and the air should be squeezed out using a squeegee.

Be careful when applying the film to unpainted plastic parts of the vehicle. In case of doubt make the water drop test. If the water continues to run off in drops after the cleaning procedure described above, it is not advisable to apply the film. If the water runs however off without marked drop formation, the film can be applied to the plastic surface. In any case, such surface should be completely smooth since no film will stick to a structured surface for long.

3 After finishing the application

The car should be left at the application temperature for additional 24 hours. After approximately three days the film will stick so tightly to the car that you can take the car through a car wash without any problems.

No polish should be applied to the car for at least three weeks after wrapping. Only wax-free water based polishes for plastic surfaces should be used.

No high-pressure cleaning or caustic chemicals should be used for cleaning the car.

For further practical information see ORAFOL's "Car wrapping" CD.

4 Removing

Please see "Practical Informations for plotter materials".

This information is based on our knowledge and experience. We have not explain all considering aspects of application. Specialized or occupational knowledge and competence of an professional sign maker are presupposed. Due to the diversity of potential influencing factors during application and use, we recommend to make own tests of our products by customers who wish to use the films for special applications. No legally binding warranty of certain qualities can be derived from our information.

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