

Processing Guidelines

No. 6, version 2014/05



Self-adhesive films for application on cars

ORAFOL® Europe GmbH

1 General remarks

ORAFOL® colour films for application on car components and car wrapping (hereinafter called "ORAFOL® colour film") are premium self-adhesive film products manufactured by ORAFOL® Europe GmbH (hereinafter called "ORAFOL®") for a temporary decoration of a vehicle.

Please note that films are by nature more sensitive than vehicle paintwork. This means that special care is needed when applying and cleaning the films. Please observe and comply with the current version of our Processing Guidelines (download under: www.orafol.com/gp/europe/en/support) when processing (applying and removing) or using and cleaning ORAFOL® colour films. Our experience shows that this is the only way to ensure the maximum service life.

The application and removal of ORAFOL® colour films may be done exclusively by trained specialists (i.e. by skilled and experienced advertising engineers or technicians).

In case of inappropriate or incorrect application or removal of ORAFOL® colour films or in case of use of film types unsuited for the application, the paint of the car may be damaged and/or the service life of the ORAFOL® colour films may be considerably shorter.

2 Service life

The service life specified in the technical data sheets is the maximum service life achieved only for vertical outdoor exposure under normal central European environmental conditions.

The following table provides an overview of the expected reduction in maximum service life under deviating environmental conditions and orientations. It is divided into three climate zones. Applications with a deviation from the vertical level of more than 10° are considered horizontal applications. The specification is valid for all colour films and metallic films of ORAFOL® suitable for vertical and horizontal application.

In case of print or digital print media, the service life data apply only to vertical uses.

The assessment of the maximum service life is based on the information in the technical data sheet of each series.

Climate zone 1): temperate

(e.g. North/Central Europe / North US)

Vertical: data in the technical data sheet
Horizontal: C1) vertical minus 50%

Climate zone 2): humid / warm

(e.g. Europe – Mediterranean region, Southeast US, Oceania)

Vertical: C1) vertical minus 2 years
Horizontal: C1) horizontal minus 1 year

Climate zone 3): dry / hot

(Middle East/North Africa, desert regions in AUS, Southwest US)

Vertical: C1) vertical minus 4 years
Horizontal: C1) horizontal minus 2 years

Exceptions

For service lives of ≤ 5 years in C1) vertical applies:
C3) vertical = C2) vertical minus 50%
C3) horizontal = C2) horizontal minus 50%

Climate zone 1)* temperate		Climate zone 2)* humid/warm		Climate zone 3)* dry/hot	
vertical	horizontal	vertical	horizontal	vertical	horizontal
10.0	5.0	8.0	4.0	6.0	3.0
8.0	4.0	6.0	3.0	4.0	2.0
7.0	3.5	5.0	2.5	3.0	1.5
6.0	3.0	4.0	2.0	2.0	1.0
5.0	2.5	3.0	1.5	1.5	0.75
4.0	2.0	2.0	1.0	1.0	0.50
3.0	1.5	1.0	0.5	0.5	0.25

* Maximum expected service life in years

Note

The information about the maximum expected service life does not constitute a legally binding guarantee, warranty or other claim. The information provided is based on practical experience from artificial and natural weathering tests under normal conditions. It cannot simply be transferred to the maximum expected service life for every vehicle given the wide variety of possible influences (e.g. additional mechanical and chemical impacts).

In case of car wrapping, the maximum expected service life is generally based on the data for horizontal application.

3 Preparation

To achieve the best possible result, the preparatory measures described below shall be taken:

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3.1 Checking the vehicle surface

The graphic films by ORAFOL® which are recommended for car lettering, car decoration and full car wrapping are all supplied with an adhesive which is balanced in terms of its composition and adhesive strength. This means that the films will not lift or damage the vehicle paintwork, provided that painting has been professionally done and has cured completely prior to application of the graphic film. ORAFOL® materials should only be applied to vehicle surfaces where the paintwork completely fulfils these quality requirements.

Please also make sure that the paintwork of the vehicle is OEM specified. In case of any doubt, please consult the car manufacturer or a specialized paint shop before application.

It is also important that the paintwork of the car is not damaged by rust, fire, scratches, grit, age-related embrittlement or similar influences.

ORAFOL® colour films must only be applied to plastic car parts, if these plastic parts are painted or have a completely smooth plastic surface. If this is not the case, the adhesion of the ORAFOL® colour films to the substrate may be considerably lower. In case of any doubt make the following water drop test before applying the film to plastic surfaces: Moisten the plastic surface with water. If the water runs off in drops, it is not advisable to apply the film. If, however, the water runs off without marked drop formation, the film can be applied to the plastic surface.

3.2 Selection of film type

The next step is to select the type of film suitable for the intended application.

- a) for applications to difficult 3D geometries and rivets which provides the benefit of excellent processibility by hot deep-drawing:

Cast films (without micro-structured adhesives)

- b) for applications to vehicles or vehicle parts without difficult 3D geometries:

Calendered films, structured films (Premium Structure Cast) and films with micro-structured (*RapidAir*®) adhesives

In case of any doubt, please ask your retailer.

Lighter shades and coloured metallic shades have by nature a lower opacity (coverage capacity) than darker shades. Dark substrates may thus change the colour impression of ORAFOL® colour films in light shades or light metallic shades. Please make sure in

advance whether the chosen ORAFOL® colour film can lead to the desired result.

3.3 Checking the selected ORAFOL® colour film

Please check the selected ORAFOL® colour film for visible defects before application. In case of any defects identified, do not use the film.

Please contact your retailer in such a case.

We expressly point out that no complaints about defects of an ORAFOL® colour film existing before the application can be accepted later on.

Use only ORAFOL® colour films of the same batch (check batch number printed at the edge of the back of the film) for one object. It is not admissible to use ORAFOL® colour films of different batches or to combine them with products of other manufacturers for one and the same object since such an approach could affect the processing or the result.

An unused sample of the selected ORAFOL® colour film (approx. 20 x 30 cm) with complete labelling at the margin shall be archived for documentation purposes.

4 Preparation of the vehicle

Please take the following steps to prepare the car:

- a) Take the vehicle to a car wash before application (no manual cleaning). Please make sure to select a cleaning programme that uses no wax. The car must be completely clean and dry when applying the film.
- b) All parts obstructing the application must be dismantled (in particular outside mirrors, door handles, trims, windscreen wipers etc.).
- c) Check the car surfaces and edges for remaining preservation wax or polish. Any such residues must only be removed with a silicone-free citrus-based industrial detergent. Surfaces with more stubborn stains can be cleaned additionally with a commercially available insect or tar remover.
- d) Never apply detergents that use nanotechnology to establish nano-sealing or nano-coating on the surface to be cleaned. Please observe manufacturer's instructions.
- e) In a next step, all surfaces to which the film is to be applied should be cleaned with the ORACAL® Pre-wrap surface cleaner or with Isopropanol. Do not use spirits. Make sure that any remaining detergents are thoroughly and completely removed.
- f) Make sure that the surfaces, edges, corrugations, hollows and joints of the vehicle are completely

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dry. Carefully remove remaining humidity under rubber seals.

5 Application of ORAFOL® colour films

The film is applied under dry conditions.

5.1 Necessary tools

The following tools are indispensable:

Tools required for applying the film:

- Film squeegee with felt edge (it is recommended to use soft natural fibre-based felts)
- film knife, paper knife or scalpel
- magnets
- hot-air gun
- infrared thermometer

Basic tools:

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

5.2 Required conditions

- The application of ORAFOL® colour films may be carried out exclusively in clean, dust-free and light-filled rooms (with rising or assembly platform).
- The vehicle surface to which the selected ORAFOL® colour film is applied must have the minimum temperature specified in the data sheet. The best possible result is achieved when the car surface temperature ranges between +21°C and +23°C. The car surface temperature is easily measured with the help of an infrared thermometer.

5.3 Test application

We urgently recommend a test application after the preparatory cleaning of the vehicle (see item 4) and before a final application. Check the final adhesion of the ORAFOL® colour film 24 hours after the test application. Repeat the preparatory cleaning process (see item 4), if the adhesion of the ORAFOL® colour film is too weak and/or air bubbles develop under the film. For reasons of comparison it is advisable to simultaneously apply the film to uncritical surfaces (e.g. the window panes of the vehicle).

The adhesion of the ORAFOL® colour film may prove too weak, if the vehicle or the vehicle parts were pre-

treated with substances using nanotechnology to establish nanosealing/nanocoating on the surface to be cleaned.

In such a case it is necessary to repeat the preparatory cleaning of the vehicle (see item 4) and to carry out another test application.

5.4 Application method

Basic remarks

High performance cast films without micro-structured adhesive can be heated and deep-drawn into corrugations. In very deep recesses (such as sharp-edged angled corrugations) these films should however be worked in, cut and applied with an overlap at the edges.

Calendared films and films with micro-structured adhesive (RapidAir®) are suitable for even or surfaces that are slightly curved in many places. These types of films must not be heated and deep drawn into deep car corrugations. Over rivets and in recesses these films have to be worked in, cut and applied with an overlap at the edges.

Premium Structure Cast films: Because of their surface structure these film must not be stretched too much during the application. Over rivets and in recesses these films have to be worked in, cut and applied with an overlap at the edges.

Freshly printed solvent digital printing media should be spread out and left to dry for at least 72 hours, irrespective of the film type. Please observe the current Processing Guidelines for digital printing materials (download under www.orafol.com/gp/europe/en/support).

Application to vehicle windows: For vehicle windows use only ORAFOL® colour films which are type-certified for such purposes in accordance with section 22a German Regulations Authorizing the Use of Vehicles for Road Traffic (StVZO). To find out whether an ORAFOL® colour film is certified for application to vehicle windows see the technical data sheet.

Such ORAFOL® colour films must only be applied to vehicle windows that are of no importance for the driver's vision. For this reason, it is not permissible to apply the films to windscreens and front side windows of a vehicle.

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 (see also the ABG, i.e. the certificate of the film). A copy of the ABG document is available for each film upon request under graphic.products@orafol.de

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Attach the enclosed label with the D number of the type-certified ORAFOL® colour film to each vehicle window to which the film is applied so that the D number is readable from the interior of the vehicle. It is also necessary to carry a copy of the ABG document in the vehicle.

General application information

- Measure the vehicle parts and pre-cut the ORAFOL® colour film generously. Cut the film in a way to avoid overlapping and studs. A width of 152 cm allows applying of the film to many car types without disturbing laps or overlapping.
- The ORAFOL® colour film should be trimmed on the vehicle.
- The cutting should always be done on the clearance edge bordering the part to which the film is applied.
- The overlapping part of the ORAFOL® colour film (clearance width) should be used for wrapping the ORAFOL colour film into the interior area of the car.
- Do not cut ORAFOL® colour film flush with car edges to avoid shrinking of the ORAFOL® colour films or mechanical wear on the open cutting edge through cleaning brushes, wind etc.
- Apply the ORAFOL® colour film also under rubber seals to avoid open edges.
- If it is unavoidable to cut the ORAFOL® colour film on the car surface, apply siliconised crepe where the cut is performed. Lift the ORAFOL® colour film slightly after cutting and remove the siliconised crepe material before finally applying the film.

Application of the film

- Position the pre-cut ORAFOL® colour film to be applied to the car surface and fix it with adhesive tape or magnets to the vehicle.
- Make sure the ORAFOL® colour film rises some 5 cm above the edges of the vehicle part to which the film is to be applied.
- Remove the backing paper from the ORAFOL® colour film and stretch the ORAFOL® colour film equally over the part to be wrapped.
- Apply the ORAFOL® colour film with big equal swings of a squeegee to the vehicle part.
- For curved surfaces (e.g. car wings), the whole ORAFOL® colour film should be heated to +40°C or a maximum +60°C using a hot-air gun.
- Any deep-drawn areas, borders and edges should be carefully reheated with a hot-air gun after application of the film in order to quickly activate the adhesive. It is necessary to reheat the ORAFOL® colour film in deep corrugations to a temperature of

+110°C up to maximum +120°C to ensure the stable structure of the film in these areas.

- Once the ORAFOL® colour film is cooled down, cut or turn in the edges of the ORAFOL® colour film. When the re-assembling of the removed vehicle parts is finished, reheat all borders, edges and corrugations again with a hot-air gun to +110°C up to maximum +120°C.
- For further practical information about the application of ORAFOL® colour films see the ORAFOL® Car Wrapping Video under: www.orafol.com/gp/europe/de/support

Important to Note

Use an infrared thermometer which allows exact measuring of the substrate temperature.

Move the hot-air gun constantly to avoid the risk of damaging the ORAFOL® colour film.

Remaining tiny air bubbles (of a diameter below 5mm) under the ORAFOL® colour film will diffuse through the film within a few days or up to three weeks 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.

6 After finishing the application

The vehicle should for at least another 24 hours be exposed to the application temperature (see also item 5.2.).

According to our experience the ORAFOL® colour film will have reached optimum adhesion after three days. You should not take the vehicle through a car wash before this time has elapsed.

In order not to affect the service life of the ORAFOL® colour film and to avoid other negative impacts of the ORAFOL® colour film or the vehicle by regular cleaning, the vehicle should only be cleaned manually or taken to a car wash offering textile washing without a hot wax programme (no brushes).

In general, ORAFOL recommends a regular cleaning and maintenance of the vehicle by hand and by using the specially developed ORACAL cleaning and care products for car wrapping with ORAFOL films which are available each as complete kits for glossy and for matt films respectively. The mild and at the same time very effective cleaning are care components contained are exactly modelled on the different sensitive film surfaces.

In addition ORAFOL explicitly recommends a primary impregnation with the ORACAL® Long-Lasting Seal contained in the corresponding Cleaning and Care sets for glossy and matt film surfaces, directly after the

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car wrapping or before first usage of the wrapped car, respectively.

The surfaces of matt and/or structured ORAFOL® colour films are naturally more sensitive than glossy and smooth ones. Accordingly, these ORAFOL® colour films must be treated very carefully during processing cleaning and care. Depending on service life and frequency a more frequent cleaning and care is necessary.

High-pressure cleaning aggressive chemicals or solvents (such as acetone, paint thinner) according to our experience usually damage the film and possibly also the vehicle paintwork and reduce the service life of the film. No high-pressure cleaning or aggressive chemicals should be used for cleaning the car. In case of any doubt, please contact our Customer Support.

The current Maintenance and Usage Terms published by ORAFOL® must be provided and explained to the customer when handing over the vehicle coated with ORAFOL® colour film.

7 Removing ORAFOL® colour films

ORAFOL® colour films are equipped with a high-quality repositionable adhesive offering permanent final adhesion. It cannot be excluded that some residue from the adhesive remains on the surface when removing the film. Such residues can be easily removed with a silicone-free citrus-based industrial detergent.

Environment and surface temperature must be at least +20 °C before the ORAFOL® colour films can be removed. First cautiously lift up one corner of the ORAFOL® colour film with a knife. Then slowly draw the film from the surface at a 180° angle. Heating the film moderately with a hot-air gun to +40°C or maximum +60°C while pulling, makes removal considerably easier. We also recommend the use of a commercially available superheated steam device. Removing behaviour is also markedly affected by the type and texture of the surface and the conditions of use.

8 Warranty information

In case of non-compliance with the Processing Guidelines and Maintenance and Usage Terms, any warranty and liability shall be excluded.

The service life of ORAFOL® colour films applied to a vehicle is essentially determined by the exact compliance with the Processing Guidelines and Maintenance and Usage Terms. The processing (i.e. the application and removal) of ORAFOL® colour films shall only be

done by trained specialists (i.e. by skilled and experienced advertising engineers or technicians).

The trained experts are responsible for the quality of application, while the responsibility for compliance with the Maintenance and Usage Terms lies with the owner of the vehicle. The information provided in these Processing and Handling Instructions is based exclusively on our current knowledge and experience. It constitutes neither a warranty of certain properties nor a quality or durability guarantee with regard to our ORAFOL® colour films. We are not responsible for costs incurred for the removal of our films.

Any warranty and liability shall be especially excluded in case of:

- new vehicle paintwork that is not completely dry or completely cured at the time of application
- wrapping of unsuitable surfaces (see also item 3.1) and of unprofessionally painted surfaces
- surfaces that are not appropriately prepared
- use of ORAFOL® materials in combination with materials from other manufacturers
- use of different batches for the wrapping of one object
- use of products or product combinations that are not recommended for the intended application
- inappropriate or improper application by unskilled and unprofessional wrappers
- paintwork coming off when removing the film and changes in the paintwork (e.g. "ghost images")
- films coming off of angled corrugations with sharp edges (frequently seen in commercial vehicles such as delivery vans or panel trucks)

In case of further questions concerning the application and removal of ORAFOL® colour films please contact our Customer Support.

Oranienburg, 28 January 2014

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