PRODUCT BULLETIN

APPLICATION GUIDE
Polyurethane film:
SMARTAC EVOLUTION

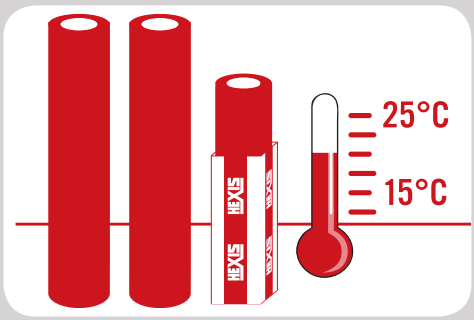
REQUIRED EQUIPMENT

- Plotter
- Tesa® 7476 adhesive tape
- Liquid cleaning "System 1-2-3"
  - 1-REMOVER
  - 2-PRE-CLEANER
  - 3-FINAL CLEANER
- Vehicle shampoo ProTech® SHAMPCAR
- EASYPOSE application fluid
- Transfer tape
- HEXIS MALCOV toolbox
- Assorted squeegees as in the catalogue
- Electric heat gun
- MPFSEC Squeegee
- Application roller ROLLRIV

STORE YOUR FILMS UNDER GOOD CONDITIONS

Keep the films away from sources of heat (radiators, direct exposure to sunlight...).

Shelf life: 2 years if stored in its original packing at a temperature between 15 °C and 25 °C (59 °F and 77 °F) and between 30 % and 70 % relative humidity.



CHARACTERISTICS

This high-performance 60 µm film is perfectly suited for outdoor signage. Its great technical efficacy and conformability allow you to use it on flat, slightly concave or convex surfaces as well as relatively wavy surfaces. This film is especially recommended for lettering on slightly complex surfaces and vehicles. (Except for metallised films intended exclusively for flat or 2D surfaces).

PREPARING YOUR APPLICATION SURFACE

You can apply your HEXIS films on a wide variety of substrates, under the condition that these application surfaces are clean, dry, smooth, non-porous and with no traces of oil, grease, wax, silicone or other contaminating agents. To avoid any bad surprises, always assume that these surfaces are contaminated and must be cleaned (cf. chapter 3).
Do not forget to carry out a preliminary test on a small surface to check this substrate does not deteriorate.

For further technical information refer to the data sheet available on the Professionals pages of our website www.hexis-graphics.com.

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Application methods are based on the manufacturer's experience and are not restrictive. To ease application, comply with recommendations.
HEXIS also offers training sessions to enable professionals to achieve optimum results.

1. RECOMMENDATIONS:

› Avoid applying the adhesive film on unpainted vehicle side strips or bumpers.

› The best adhesion of the SMARTAC EVOLUTION is achieved after 24 hours of contact.

2. PRELIMINARY TEST OF FLAT SURFACES:

Before an application, the installer must carefully inspect the substrate and the paint onto which the film is to be applied.

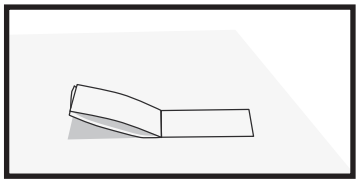
The installer and the client are responsible for the correct evaluation of the suitability of the condition of the target surface to be covered.

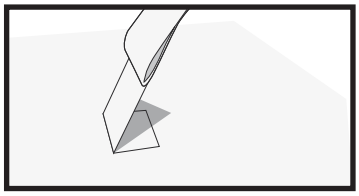
2.1. Preliminary inspection of the substrate:

› Any fresh paint must be dried for at least 7 days at 25 °C (77 °F) to outgas completely. An outgassing test must be carried out before applying the film.

› Any old, dusty or flaky paint must be sanded down and restored before application and must undergo a tear off test.

2.2. Tear off test:





With a TESA® 7476 adhesive tape, or an equivalent, apply on an area of 2.5 cm x 5 cm (1 in x 2 in) plus some leftover space to allow for fingers to hold it. Fold and quickly pull off perpendicularly to the surface. No trace should remain on the removed adhesive. Repeat this operation in several places.

› On request, HEXIS can provide you with Tesa® adhesive tape in 2.5 cm x 5 cm (1 in x 2 in).

2.3. Outgassing test:

Use a square of around 15 cm x 15 cm (6 in x 6 in) of adhesive polyester or of the film to apply. Wait 24 hours or 2 hours at 65 °C (149 °F). If any bubbles appear, this means the surface has insufficiently outgassed. This operation can be repeated after several days, or carry out the operation below.

2.4. Outgassing procedure with flame treatment:

(polycarbonate, translucent or diffusing methacrylate, expanded PVC …)

This method consists of changing the surface tension of a substrate by swiping it with the flame of a gas burner. Have the flame swipe past quickly with a horizontal and vertical sweep along the whole substrate (use the flame's blue tip).

⚠ *Move the flame in swiping movements (risk of destroying the substrate if a fixed point is heated for longer than one second). The film must be applied immediately as this light surface treatment disappears after a few minutes.*

⚠ *HEXIS is not liable for any bubbles caused by outgassing.*

3. CLEANING

It is absolutely necessary to clean the substrate before the installation. It should be assumed that the substrate is contaminated. Some residues or contaminations may not be visible, but will all the same impact on the adhesion of the film.

⚠ *Before any cleaning liquids or chemicals are used refer to the Technical Data Sheets and the Health and Safety Data Sheets available for download from our website: www.hexis-graphics.com.*

3.1. Clean surface appearance:

For application of letterings on the vehicle, it is recommended to wash the vehicle with the SHAMPCAR vehicle shampoo and then to use the PRE CLEANER (Product 2).
Spray onto the surface. Leave to work for a few moments then wipe with a clean cloth.
Finish with a final clean with FINAL CLEANER (Product 3).

3.2. Soiled surface appearance:

For application of letterings on the vehicle, it is recommended to wash the vehicle with the SHAMPCAR vehicle shampoo and then to use the PRE CLEANER (Product 2).
Spray onto the dirty surface. Leave to work for a few moments, then wipe dry with a clean cloth. Carry out a final cleaning using FINAL CLEANER (Product 3).

3.3. Heavily soiled surface appearance:

For application of letterings on the vehicle, it is recommended to wash the vehicle with the SHAMPCAR vehicle shampoo and then to use ADHESIVE REMOVER (Product 1).

Use in a ventilated area. Wear protective gloves and goggles.

Test a small, non-conspicuous area for compatibility of the substrate before treatment. Certain plastic materials may indeed be damaged by the product ADHESIVE REMOVER (Product 1).

› Spray onto the dirty surface and spread out using a dry cloth.

› Leave to work for a few moments. Spray again with ADHESIVE REMOVER (Product 1), then wipe with a clean cloth or squeegee.

› When the substrate is clean and dry, clean again with PRE CLEANER (Product 2), then finish with the product FINAL CLEANER (Product 3) (refer to use below).

Shampcar
concentrated vehicle shampoo

Adhesive Remover
Powerful cleaning agent

Pre Cleaner
Powerful universal cleaning agent

Final Cleaner
Cleaning and degreasing finishing agent

4. CUTTING OF FILMS:

The films should preferably be stored in the same environment as the cutting area.

Check the cutting strip on the plotter is perfectly smooth and not scratched. A damaged cutting strip reduces the cutting quality.

Be sure to find the correct blade speed and pressure so as to cut the film and adhesive surface.

The blade pressure should be adjusted according to the film. The film colour is given by the pigment load which may cause different degrees of hardness when cutting. Thus a red film following a white film may need more pressure.

It is recommended to carry out a plotter test before commencing a full production run.

> If there is too much pressure, the liner (silicone paper) may undergo a scarification into which the adhesive may seep which makes the weeding more difficult, or even delaminate the liner paper weakened in the cutting area.

In all cases it recommended to weed immediately after plottering.

4.1. Introduce to the cutting:

The minimum height possible for cutting depends on the condition of the blade, the pressure and the speed. Generally the acceptable height is 10 mm (0.4 in), the descender line is 1.5 mm (0.06 in) with an average speed and a blade in good condition. Small characters may be obtained by reducing the speed.

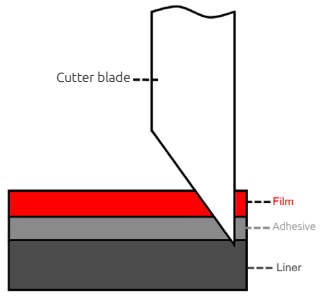


Fig. 01

For instance on a ROLAND® GX24 cutting plotter the recommended medium speed is 20 cm/s (7.87 in/s).

Note: In all cases carefully read the operating manual of the cutting plotter and carry out a preliminary test.

The blade must cut the polyurethane film and the adhesive surface. (FIG. 01)

A blunt and used blade will affect the cutting quality and will require a stronger pressure. It will also be more difficult to weed.

After cutting, proceed with the weeding, meaning removing any excess film. For this, carefully remove the excess film by peeling it from the liner at a 180° angle, leaving the design to be transferred on the liner. Ideally, the weeding should be done immediately after the cutting.

Generally, it is easier to weed the graphics from right to left. Nevertheless, certain fonts strip easier from left to right.

Pay very special attention to small designs which may easily be torn off when stripping.

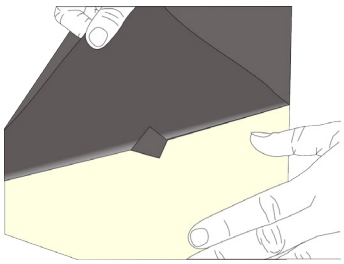


Fig. 02

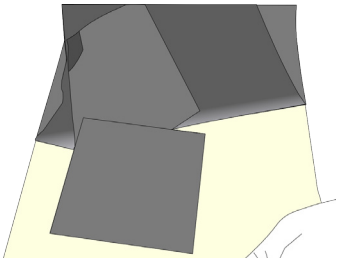


Fig. 03

4.2. Preliminary plotting test:

In order to set the plotters parameters, we advise you to make a preliminary test:

› Cut a square of 10 cm x10 cm (4 in x 4 in).

› Weed remove any excess material.

› Check:

- › that the cut square adheres well on the liner. (FIG. 02) (FIG. 03)
- › that the liner has not suffered any cuts.

› Weeding will be easy and efficient if the plotter is properly set up (pressure, speed, condition of the blade).

4.3. Selecting the transfer film (tape):

The character sizes to transfer and the temperature conditions determine the selection of transfer papers and films. Small characters and low temperature call for a High Tack Tape. The application, with water or dry, and even the adhesive force desired of the Tape, will determine the selection of a specific sort of Tape.

Do not leave the Tape too long in contact with the graphics. It is better to carry out the transfer the day after placing the Tape.

> HEXIS offers a range of transfer films and papers in their catalogue.

4.4. Transfer operation:

› After weeding, place the tape on the graphics and rub down vigorously using a squeegee (pushing hard on the small type).

› In the case of small letters, it is preferable to turn over the Paper/Tape compound (Tape underneath, liner on top) and remove the liner while maintaining the Tape in a horizontal position.

5. APPLICATION OF THE GRAPHICS OR THE SMARTAC EVOLUTION FILM:

Before any application of the SMARTAC EVOLUTION film, make sure all the surfaces are clean (cf. paragraph 3) and pay particular attention to the critical areas such as the corners and edges.

The “dry” procedure allows to apply the SMARTAC EVOLUTION film on complex surfaces: corrugated iron, riveted …

The “wet” procedure is reserved exclusively for flat surfaces.

The ideal application temperature is between 15 °C and 25 °C (59 °F and 77 °F) and must be respected equally for both the ambient and the substrate temperatures. The hygrometry may result in a less effective adhesion of the film on the substrate. In a cold environment, the transfer tape must be left longer before being removed. Several days are needed to finish the final adhesion of the film.

5.1. Dry procedure:

In all cases, apply first on flat surfaces (cf. paragraph 5.1.1).

⚠ *For metallised Smartac films: application exclusively on flat or 2D surfaces.*

5.1.1. Procedure for application of SMARTAC EVOLUTION on flat surfaces:

› Position the marking (Tape / Film / Liner compound) on the target area and fix it with the help of magnets or with masking tape (available in the MALCOV tool case). (FIG. 04)

Fig. 04

› In the case of large graphics remove part of the liner, the entire line in the case of small graphics (cf. paragraph 4.4). Stretch the tape properly before applying onto the surface. (FIG. 05)

Fig. 05

› Start applying the film - only on the flat surfaces - using a soft MARBLEU-type squeegee which has been covered in felt beforehand (FIG. 06). The squeegee forms about a 45° angle with the surface and the application is done working from the middle to the edges of the graphics paying particular attention to firmly press down the contours.

Fig. 06

Fig. 07

› Continue removing the liner and applying the graphics only on the flat surfaces. (FIG. 07)

Fig. 08

› To apply on flat surfaces, press hard over the whole surface, paying particular attention to firmly press down the contours. (FIG. 08)


Fig. 09

› Carefully remove the Tape (FIG. 09) at an angle of 180° in relation to the surface.
The installation is now finished.

› For an application on a surface with deformations proceed with the following steps:

⚠ *For metallised Smartac films: application exclusively on flat or 2D surfaces.*

› Squeegee all areas of the compound positioned on flat surfaces planes paying particular attention to firmly press down the contours.

› Carefully remove the tape at an angle of 180° in relation to the surface.

› Apply the rest of the film positioned over deformations according to the steps described in the following paragraphs. (FIG. 09)

5.1.2. Slightly concave surfaces

Step 5.1.1 is now finished - proceed as follows:

› Put on cotton gloves (available in MALCOV toolkit).

› Stretch the film over the substrate without extending over 20% so that the latter can touch any possible embossed parts.

⚠ *Metallised Smartac films should not be stretched: application exclusively on flat or 2D surfaces.*

› Heat the deformed part between 40 °C and 50 °C (104 °F and 122 °F).


Fig. 10

› With a finger, apply the film working from the centre out. The application is done from the edges of the deformation towards the hollow. (FIG. 10)

› Once the work done, heat (between 80 °C and 90 °C / 176 °F and 194 °F) all the hollow parts which are largely deformed so as to thermoform the end product.

5.1.3. *Slightly convex surfaces*

Step 5.1.1 is now finished – proceed as follows:

› Heat the film between 40 °C and 50 °C (104 °F and 122 °F), then stretch the film, without extending over 20%, so as to cover the whole curved surface. (FIG. 11)

⚠ *Metallised Smartac films should not be stretched: application exclusively on flat or 2D surfaces.*

› Apply the film over the whole surface using a felt-covered plastic squeegee and run it gently along the curved area to make any bubbles or folds disappear.

› If necessary, lift off, re-stretch and reapply.

› Heat the edges between 80 °C and 90 °C (176 °F and 194 °F).

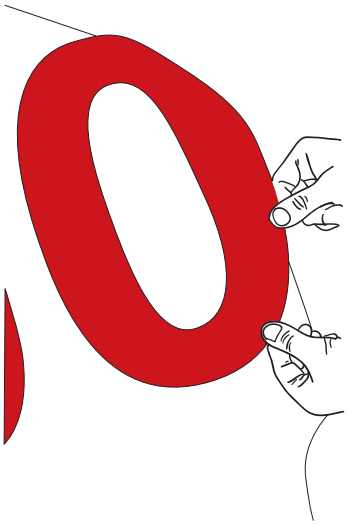


Fig. 11

5.1.4. *Additional information*

› For all vehicles, application on the air duct seals of windows and body joints is totally prohibited.

› Avoid gluing SMARTAC EVOLUTION film on unpainted parts, such as side strips or bumpers.

› Over time, certain horizontal applications such as hoods or roofs may diminish in colour or shine compared to the parts exposed vertically. Hexis is in no way liable for long-term product efficiency on areas constantly exposed to sunlight or extreme temperatures.

5.2. Using the heat gun:

You just used the heat gun for the dry procedure method for complex surfaces (concave, convex and riveted).
The application finished, reheat using the heat gun all the parts which underwent severe warping . The heating temperature must be between 80 °C and 90 °C (176 °F and194 °F). Check with the help of a laser thermometer (included in the MALCOV HEXIS).
This heat allows for acceleration in the gluing process of the adhesive which is sensitive to the pressure. In this way, the film will be definitively thermoformed.

5.3. Wet procedure:

This application procedure is strictly for flat surfaces only. Never use this procedure for complex surfaces.

In all cases of wet application, the work-time will largely depend on the care taken to evacuate all water under the film otherwise a bubble problem will persist.
Use a plastic felt-covered squeegee or a MPFSEC squeegee, having already wet beforehand the film surface to avoid having it scratched. Wait for it to dry before removing the Tape transfer.

› Wet the substrate to be covered.

› Apply the SMARTAC EVOLUTION film on the substrate (liner on outer side).

› Take off the protective liner and wet the adhesive side with the EASY POSE solution.

› Turn over the film and stretch it.

› Position the film by sliding it.

› Wet the graphic side with the EASY POSE solution to decrease the squeegee friction.

› Using a squeegee, get rid of the film of water by working from the centre out to the film edges and by pushing harder and harder. Repeat this operation until all the water is gone.

Note: the application time is longer than the dry procedure as each visual must be dry before handling the whole design.

Caution: if you are using a application film (Tape), you must wait 1 to 6 hours before removing it without causing any damage to the film or the substrate.

6. CLEANING AND FILM MAINTENANCE:

The Cast SMARTAC EVOLUTION film may be cleaned by any conventional automatic cleaning methods, with cleaning products and detergents used in the framework of professional maintenance for vehicles and promotional equipment. Nevertheless be careful when cleaning. Use an average pressure at a distance of at least 50 cm (20 in) and a water temperature of 35 °C (95 °F) maximum.

⚠ *Caution: the film should not be cleaned in the 48 hours following the application at the risk of altering its adhesion which might result in the film lifting off.*

⚠ *Caution: corrosive agents and detergents are prohibited.*

⚠ *HEXIS is not liable for any adhesive films cleaned with the unspecified additives from cleaning stations.*

⚠ *Car washes: the added products and the condition of the rotating brushes can harm the appearance of the graphics or films. It is a fact that after 10 car washes, the polyurethane paint becomes streaked, so consequently and in the same way, these mechanical effects can alter the film aspect which frees us from any responsibility.*

HEXIS tip: always be sure to test a small surface before proceeding with the cleaning of your overlapping.

7. REMOVAL PROCEDURE:

The SMARTAC EVOLUTION film is equipped with a permanent adhesive and for this reason its removal needs some attention. Nevertheless, by following the instructions below, the removal will be relatively easy.

› Using a heat gun, start from one corner and heat the film at a temperature around 60 °C (140 °F) (use the laser thermometer).

› Pull up the corner using a cutter – available in the toolbox – without damaging the substrate and slowly lifting the heated parts. Continue pulling the film at a 70° to 80° angle compared to the substrate.

⚠ If the angle is too wide or acute, there is a risk of the film cracking.

› Always work on small heated areas by gently pulling up the film to decrease the risks of leaving adhesive on the substrate or of tearing the film.

› Continue heating and gently pulling off the film until there is none left. Always be aware of the active heat, the tearing angle and the tearing speed.

› If some adhesive remains on the substrate, take a cloth soaked in our ADHESIVE REMOVER (product 1) and rub the substrate until all traces disappear.

⚠ Caution: never put the liquids in contact with the window or body sealing gaskets.

⚠ Before using any of our liquids, please consult our technical data sheets on our Website at: www.hexis-graphics.com

For further information of a technical nature, refer to Technical Data Sheets available for download from our website *www.hexis-graphics.com* under professionals / data sheets.

The great diversity of media and the ever growing number of possible applications commit the user to ensure that the product is suitable for each particular usage. The information given does not constitute a warranty. The seller assumes no liability for claims or damages beyond the replacement value of a product. Specifications are subject to changes without notice. Updates to specifications can be found on our website *www.hexis-graphics.com*.

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