PRODUCT BULLETIN

APPLICATION AND REMOVAL METHOD

Cast Vinyl Film

SMARTAC KG8000

REQUIRED EQUIPMENT

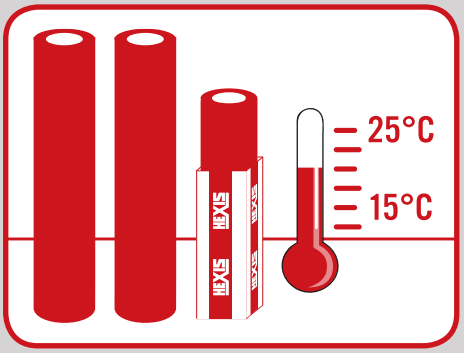
- Plotter
- Adhesive tape Tesa® 7476
- Masking tape
- Liquids for the cleaning of application surfaces:
  - ADHESIVE REMOVER or SHAGREMOVE
  - FINAL CLEANER or SHAGCLEAN
- ProTech® SHAMPCAR car body shampoo
- Liquid for an easier application: HEXISGEL or EASYPOSE
- Squeegees upon your choice from the catalogue
- YELSQUEEG or BLUESQUEEG squeegee
- ROLLRIV application wheel for application over rivets
- RIVETBRUSH application accessory for riveted surfaces
- PISTHERMIQ heat gun
- PISTLASER3 laser thermometer
- Different HEXIS application tools
- ProTech® cleaning agents

STORE YOUR FILMS UNDER APPROPRIATE CONDITIONS

Keep the films away from any major sources of heat (radiators and heaters, direct exposure to sunlight, etc.): the ideal temperature ranges from 15 °C to 25 °C (from 59 °F to 77 °F).

Store them in an atmosphere with low humidity (with relative humidity between 30 % and 70 %).

Keep your films in their original packaging. Each opened roll must be stored vertically or suspended in order to avoid pressure marks on the contact surface.



FEATURES

The KG8000 series, consisting of a 50-µm PVC, is particularly suitable for outdoor signage. Due to its high technical performance and conformability, it may be used on curved or textured surfaces (weldings and rivets) and it is especially recommended for lettering on complex surfaces and vehicles.

PREPARING YOUR APPLICATION SURFACE

HEXIS films can be applied to a wide variety of substrates as long as the target surface is clean, dry, smooth, non-porous and free from any traces of oil, grease, wax, silicone or other contaminants. To avoid unexpected outcomes, always assume that every substrate is dirty and needs to be cleaned. (cf. chapter 3).
Do not forget to carry out a preliminary trial on a small surface to check that the substrate remains undamaged.

For further information on the films used, please refer to the technical data sheets available on our website at www.hexis-graphics.com.

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Application methods are based upon HEXIS' experience and are non-restrictive. Comply with instructions to ease application of HEXIS films.
HEXIS also offer training sessions for beginners and professionals to achieve optimum results.

1. RECOMMENDATIONS:

› The KG8000 film adheres particularly well to glass, steel, aluminium, PVC and melamine.

› The KG8000 film has less adherence to the following substrates: low energy (polyethylene, polypropylene, etc.), grained or textured substrates or those coated with acrylic paint.

› In the case of a vehicle wrap, avoid applying the self-adhesive film to unpainted components such as trims or unpainted bumpers.

› For any other substrate, preliminary tests must be carried out.

› The best adhesion of the KG8000 film is achieved after 24 hours of contact.

2. PRELIMINARY TEST OF THE APPLICATION SURFACES:

Before any application, the installer must first inspect the substrate and the paint to which the film will be applied.

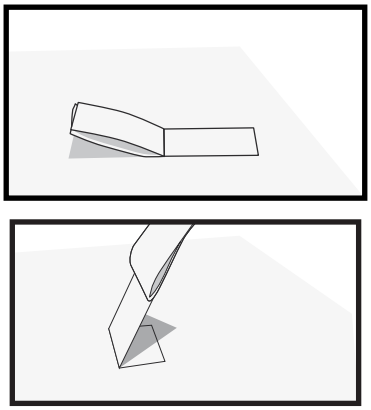
The installer and the client are responsible for the suitability evaluation of the target surface to be covered.

2.1. Preliminary inspection of the substrate:

› Any fresh new paint must be dried for at least 7 days at 25 °C (77 °F) in order to degas completely. A degassing test must be carried out before applying the film.

› Any old, powdery or flaky paint must be sanded and renewed before application and must undergo a tear-off test.

2.2. Tear-off test:



Using a TESA® 7476 adhesive tape, or similar, apply it to a surface of 2.5 cm x 5 cm (1 in. x 2 in.) plus some overhang material for easier removal. Fold and promptly tear it off perpendicularly to the substrate surface. No traces should remain on the ripped off adhesive tape. Repeat this process in several places.

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

2.3. Degassing test:

(For checking) Use a square of around 15 cm x 15 cm (6 in. x 6 in.) of self-adhesive polyester or of the film to be applied. Wait for 24 hours or 2 hours at 65 °C (149 °F). The appearance of bubbles indicates that the substrate has not sufficiently degassed. Therefore, this process should be repeated after a couple of days; or the procedure described below should be carried out.

2.4. Degassing procedure with flame treatment:

(Polycarbonate, translucent or diffusing methacrylate, expanded PVC, etc.)

This method consists of changing the surface tension of a substrate by swiping it with the flame of a gas burner. Using the flame's blue tip, proceed evenly with fast sweeps horizontally and vertically along the whole substrate surface.

⚠ *MOVE THE FLAME IN SWIPING MOTIONS ON THE SUBSTRATE (RISK OF DESTROYING THE SUBSTRATE IF A FIXED POINT IS HEATED MORE THAN A SECOND).*

The film must be applied right after this treatment as this light surface treatment disappears after a few minutes.

> HEXIS are not liable for any bubbles caused by degassing.

3. CLEANING:

Cleaning of the substrate is required before performing the application. It should always be assumed that the substrate is contaminated with dirt. Some residues or contaminants may not be visible; however, they may impact the adhesion of the film.

⚠ *Before using any cleaning liquids or chemicals, please refer to the Technical Data Sheets and Safety Data Sheets available for download on our website: www.hexis-graphics.com.*

3.1. Clean and soiled surface appearance:

For vehicle wraps, it is advised to wash the vehicle with the SHAMPCAR vehicle body shampoo, then carry out a final cleaning using the FINAL CLEANER or SHAGCLEAN.

Shampcar
Concentrated vehicle shampoo

3.2. Heavily soiled surface appearance:

For vehicle wraps, it is advised to wash the vehicle with the SHAMPCAR vehicle body shampoo, then use the ADHESIVE REMOVER or SHAGREMOV.

⚠ *The cleaning with the ADHESIVE REMOVER and SHAGREMOV must be carried out in a ventilated area. Wear protective goggles and gloves.*

Prior to treatment, run a compatibility test on a small, inconspicuous area of the substrate to be treated. Indeed, certain plastic materials might be damaged by the ADHESIVE REMOVER and SHAGREMOV.

SHAGREMOV
Powerful cleaning agent

› Spray the ADHESIVE REMOVER or SHAGREMOV onto the dirty surface and spread out using a dry cloth.

› Then wait for a few minutes. Spray the ADHESIVE REMOVER or SHAGREMOV again, then wipe it dry with a clean cloth or squeegee.

› When the substrate is clean and dry, carry out a final cleaning using the FINAL CLEANER or SHAGCLEAN.

SHAGCLEAN
Cleaning and degreasing finishing agent

3.3. Special case:

Remember to adapt the preparation methods to the substrate type and its condition. Thus, painted surfaces must be dry and hard, baked paints must be cooled down. Air-dried paints or car paints need to be dried for a minimum of one month before applying the film.

› For bare metallic surfaces in the case of a full wrap:

› Clean the substrate with soapy water and then with a cloth soaked with FINAL CLEANER or SHAGCLEAN.

⚠ *Before using any cleaning liquids, refer to the Product Safety Data Sheet.*

› Thoroughly wipe the surface after the cleaning process.

4. FILM CUTTING:

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

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

Set the correct cutting speed and blade pressure so as to cut the film and the adhesive-coated surface.

The pressure of the blade has to be adjusted depending on the film. The film colour is given by the pigment loads which may cause different degrees of hardness when cutting. Thus, a red film that is cut after a white film may need more pressure.

It is recommended to carry out a plotting test before starting a production run.

If the pressure is too high, the protective liner may slightly crack causing adhesive bleeding.

This would make the weeding process more difficult.

In any case, it is recommended to weed the material immediately after the cutting.

4.1. Introduction to plotting:

The smallest possible size to be cut depends on the condition of the blade, pressure, cutting speed and plotter. In general, an acceptable height is 10 mm (0.4 in), with serifs of 1.5 mm (0.06 in.), at medium speed and with a blade in good shape. Smaller letters can be obtained by reducing the speed.

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

> Note: In any case, carefully read the cutting plotter's instructions and carry out a preliminary plotting trial.

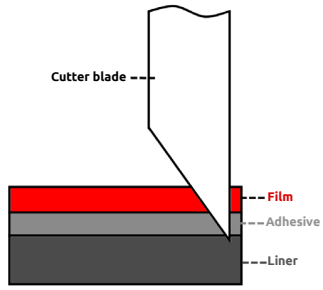


Figure 01

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

A blunt and worn blade will impair the quality of the cutting and will require a higher pressure. Weeding will also be more difficult.

After cutting, proceed with the weeding, that means removing any excess film. For this, carefully remove the excess film by peeling it from the liner at an angle of 180 degrees, leaving the image to be transferred on the liner. In any case, it is recommended to weed the material right after the cutting.

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

Pay very special attention to small graphics which may easily be torn off when weeding.

4.2. Preliminary plotting test:

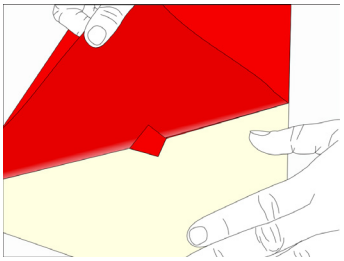


Figure 02

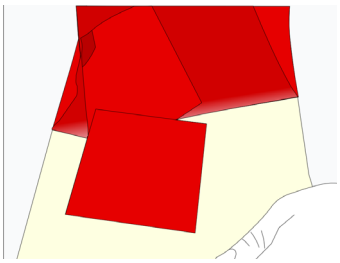


Figure 03

In order to determine the plotter settings, we advise you to carry out a preliminary test:

› Cut a square of 10 cm x 10 cm (3.94 in. x 3.94 in.).

› Weed: remove any excess material.

› Check:

- › that the cut square adheres well to the liner; (FIG. 02) (FIG. 03)
- › that the liner is free of any incision.

› Weeding will be successful if the plotter is properly set up (pressure, speed, shape of the blade).

4.3. Selecting the transfer film (tape):

The size of the characters to be transferred and the temperature conditions determine the selection of the transfer papers or films that must be used. Small characters and low temperatures require the use of a High Tack Tape. The application, wet or dry, as well as the desired adhesion strength of the tape will determine the selection of a specific adhesive type for the transfer.

Do not leave the tape in contact with the graphics for too long. It is recommended to carry out the transfer the day after the application of the tape.

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

4.4. Transfer operation:

› After weeding, the application of the tape must be followed by a vigorous squeegeeing (firmly pressing on the small characters).

› In the case of small characters, it is recommended to turn the paper / tape assembly (tape underneath, liner on top) and to peel off the liner while keeping the tape in a flat horizontal position.

5. APPLYING THE GRAPHICS OR KG8000 FILM:

Before any application of the KG8000 film, make sure that all surfaces are clean (cf. paragraph 3), paying particular attention to critical areas such as corners and edges.

The «dry» application method allows for the application of the KG8000 film to complex surfaces: strong deformations, corrugated iron, rivets, etc.

The «wet» application method is reserved exclusively for flat surfaces.

The ideal application temperature ranges from 15 °C to 25 °C (59 °F to 77 °F) (minimum 7 °C (45 °F)) and must be respected for both the ambient and the substrate temperatures. Hygrometry may also result in a lower adhesion of the film to its substrate. In a cold environment, the transfer tape should be left on longer before its removal because several days are necessary to complete the final adhesion of the film.

5.1. Dry application method:

In all cases, start applying to flat surfaces. (cf. paragraph 5.1.1)

5.1.1. First steps and application of KG8000 film to flat surfaces:

› Position the marking (Tape / Film / Liner complex) on the target surface and fix it using magnets or a masking tape. (FIG. 04)

Figure 04

› In the case of big graphics, remove only a part of the liner, in the case of small graphics, remove the whole liner (cf. paragraph 4.4). Tightly stretch the tape before applying it to the surface.

› Start applying the film, only to flat surfaces, using a soft squeegee (like MARBLEU), previously covered with felt (FIG. 05). The squeegee forms an angle at around 45 degrees with the substrate and the application has to be carried out from the centre towards the borders of the graphics, firmly pressing on the edges.

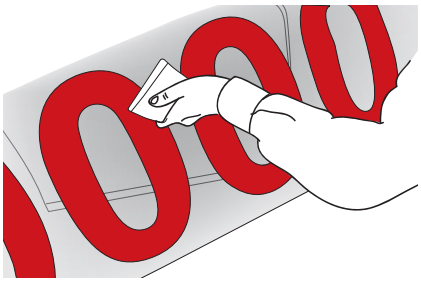


Figure 05

› In the case of big graphics, remove the rest of the liner and apply the film to flat surfaces only, using a soft squeegee (like MARBLEU), and by firmly pressing on the borders.

5.1.1.a. Application to completely flat surfaces

› Squeegee the whole graphics surface to which the tape has been applied and firmly press on the borders of the graphics.

Figure 06

› Carefully remove the tape (FIG. 06) by forming a 180-degree angle with the substrate.

The application is complete.

5.1.1.b. Application to surfaces with moderated deformations

› For an application to surfaces with moderated deformations, proceed step by step:

› Squeegee again all parts of the complex that are positioned on flat surfaces by firmly pressing on the borders.

› Carefully remove the tape by forming a 180-degree angle with the substrate.

› Apply the rest of the film positioned above the deformations according to the steps described in the following paragraphs. (FIG. 06)

5.1.2. Concave surfaces

After having completed step 5.1.1b, proceed as follows:

› Wear cotton gloves.

› Stretch the film on the substrate so that it touches the possible peaks.

› Heat the deformed part to a temperature ranging from 40 °C to 50 °C (104 °F to 122 °F).

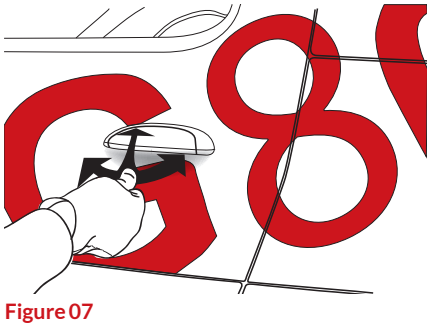


Figure 07

› Apply the film with your finger, carrying out movements from the centre towards the borders. The application is done from the edges of the deformation towards the hollow. (FIG. 07)

› Once this step is completed, heat all the hollow parts which have undergone heavy deformation between 80 °C and 90 °C (176 °F and 194 °F) to thermoform the product definitively.

5.1.3. *Convex surfaces*

After having completed step 5.1.1b, proceed as follows:

› Heat the vinyl to a temperature ranging from 40 °C to 50 °C (104 °F to 122 °F), then stretch the film so as to wrap the convex surface. (FIG. 08)

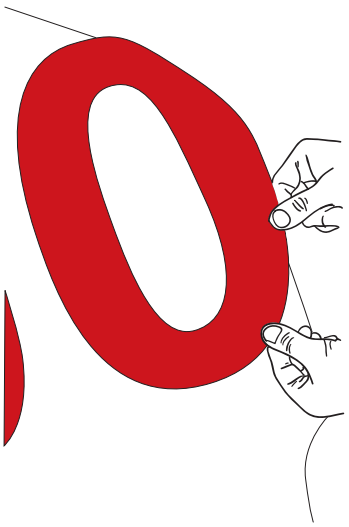


Figure 08

› Apply the film over the whole surface using a felt-covered, plastic squeegee, and carefully wipe over the convex area to smooth the film and eliminate any tensions and folds.

› If necessary, lift the film, stretch it again and apply it.

› Heat the borders to a temperature ranging from 80 °C to 90 °C (176 °F to 194 °F).

5.1.4. *Riveted surfaces*

After having completed step 5.1.1, proceed as follows:

› When you encounter a rivet, stretch the film. Gently heat to a temperature ranging from 40 °C to 50 °C (from 104 °F to 122 °F). Then dab the rivets with the RIVETBRUSH to apply the film to them.

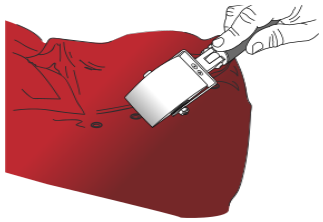


Figure 09

› Then slide the ROLLRIV (FIG. 09) over the film to make it adhere to the entire rivet surface. Press it all around the rivet using a squeegee or your thumb.

› To finish, use the RIVETBRUSH and firmly apply it to the rivets (still by dabbing).

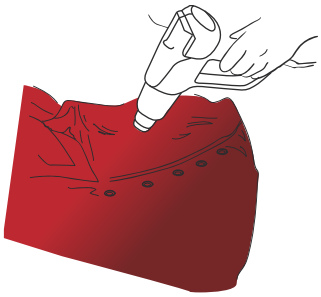


Figure 10

› Then heat each rivet again to 80 °C - 90 °C (176 °F - 194 °F). (FIG. 10)

5.1.5. *Additional information*

› For vehicles, the application of film to window and body panel seals must be avoided by all means.

› Avoid applying the KG8000 film to unpainted components such as trims or unpainted bumpers.

› Whenever a horizontal application becomes necessary, such as on engine hoods or roofs, this may lead over time to a slight fading of colour and gloss compared to vertically exposed areas. As these areas suffer maximum exposure to sunlight and climatic influences, they are not covered by the HEXIS warranty regarding durability.

5.2. Use of the heat gun or gas torch:

You have used the heat gun or torch for dry application to complex surfaces (concave, convex, riveted).

Once the application is finished, heat once more all the parts which have undergone severe deformation using the heat gun. The heating temperature must range from 80 °C to 90 °C (176 °F to 194 °F). Check it using the laser thermometer (PISTLASER3).

⚠ *Caution: The temperature must be checked with the laser thermometer on the surface of the film. Do not measure the temperature in the air flow of the heat gun. This would give a wrong measurement and could lead to an insufficient reheating temperature (risk of the film peeling off later).*

Heat accelerates the bonding process of the pressure-sensitive adhesive. In this way, the film will be definitively thermoformed.

5.3. Wet application method:

This application method is reserved exclusively for flat surfaces. Do not use this method for complex surfaces.

In all cases of wet application, the durability of the work greatly depends on the care taken to eliminate the water beneath the vinyl, otherwise a risk of bubbles will remain. After having previously wet the film surface so as not to scratch it, use a felt-covered plastic squeegee or a YELSQUEEG or BLUESQUEEG squeegee. Wait for it to dry before removing the tape transfer.

› Moisten the substrate to be treated.

› Apply the KG8000 film to the substrate (liner facing outwards).

› Remove the protection liner and moisten the adhesive-coated side with the HEXISGEL or EASYPOSE liquid or water.

› Turn the film over and pre-adjust it.

› Position the film by sliding.

› Moisten the graphics' face with the HEXISGEL or EASYPOSE liquid or water to reduce squeegee friction.

› Using the squeegee, eliminate any liquid from the film by working from the centre towards the film edges, pressing harder and harder. Repeat the operation until all water has been eliminated.

Note: the application time is longer than that of the dry procedure as each image must be dry before handling the whole decoration.

Caution: if you are using an application film (tape), you must wait for 1 to 6 hours before removing it without damaging the film or substrate.

6. CLEANING AND MAINTENANCE OF THE KG8000 FILM:

For optimum maintenance of the KG8000 film, HEXIS suggest to use their range of ProTech® cleaning agents specially designed for total wraps.

The cast KG8000 film can be cleaned in any conventional automatic car wash, using cleaning products and detergents used for professional maintenance of vehicles and advertising equipment.

Nevertheless exercise care when cleaning with high-pressure cleaners: Apply medium water pressure at a minimum distance of 50 cm (20 in.) and a maximum water temperature of 35 °C (95 °F).

⚠ *Caution: However, do not wash the film within the 48 hours following its application as this can affect the adhesion that may result in the film peeling off.*

⚠ *Caution: Solvents and corrosive detergents are forbidden.*

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

⚠ *Car washes: The additive products and the condition of the rotating brushes may impair the adhesion of the graphics or films. It is commonly admitted that after 10 car washes, the polyurethane paint becomes streaked; therefore, we are not accountable for these mechanical effects that may affect the film appearance.*

HEXIS tip: Always carry out a test on a small area before cleaning the entire covered surface.

7. REMOVAL PROCEDURE:

The KG8000 film features a permanent adhesive and therefore its removal needs some attention. Nevertheless, by following the instructions below, the removal will be relatively easy.

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

› Gently lift the corner with the cutter without damaging the substrate, and gradually remove the previously heated film; the film should form a 70- to 80-degree angle with the substrate.

⚠ *An angle more or less wide will cause the film to break more easily.*

› Always proceed gradually by heating small areas while carefully removing the film so as to limit the risk of leaving any adhesive on the substrate or tearing off the film.

› Continue to carefully heat and peel off the film gently until it is completely removed while keeping a watchful eye on the heat applied, on the pulling angle of the film, and the pulling speed.

› If any adhesive remains on the substrate, take a cloth soaked with our ADHESIVE REMOVER or SHAGREMOV and rub the surface until all traces disappear.

⚠ *Prior to treatment, run a compatibility test on a small, inconspicuous area of the substrate to be treated. Certain plastic materials, body panel seals, etc. might be damaged by the cleaning products. Take the necessary precautions to protect the most sensitive parts before performing the clean-up. HEXIS are not liable for damages and degradations caused to the substrate by using incompatible products.*

⚠ *Before using any of our liquids, please refer to the technical data sheets available on our website at www.hexis-graphics.com.*

HEXIS

www.**hexis-graphics**.com