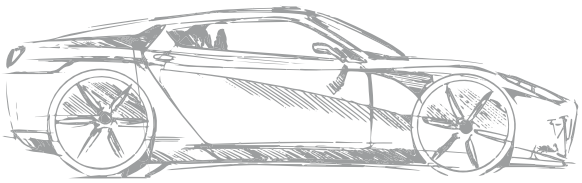
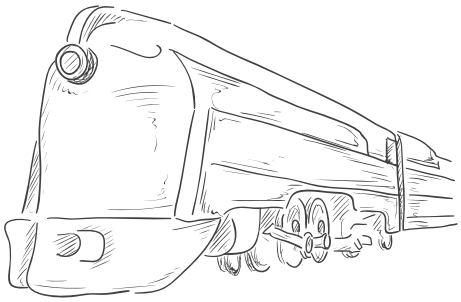
HEXIS

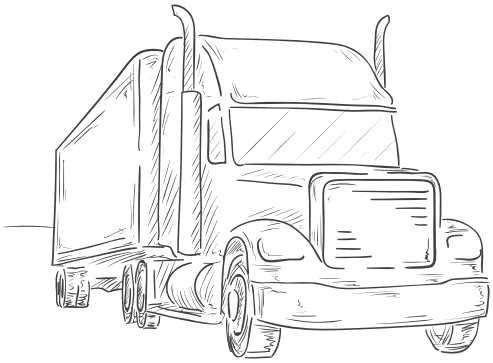
GRAPHICS DIVISION

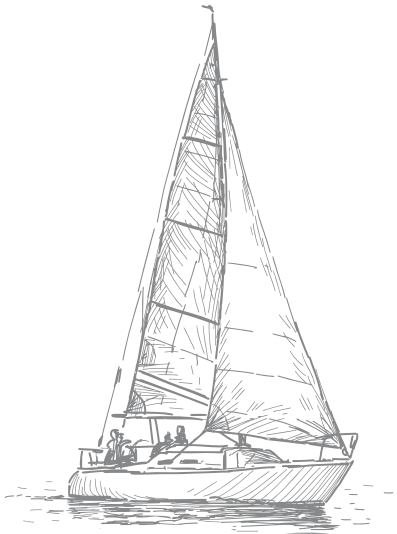
SKINTAC HX45000

SELF-ADHESIVE FILM FOR CUSTOMISATION OF MEANS OF TRANSPORT









The SKINTAC HX45000 series embodies the highest quality in the HEXIS film range for application to means of transport. The SKINTAC HX45000 series is composed of a 100-µm, multilayered cast film (150 µm for the structured films) and a HEX'PRESS technology liner. Its high technical performance and its conformability are perfectly designed for use on curved and textured surfaces (weldings and rivets).

- ✓ Cast film, composed of multiple and successive layers, each one being chemically different from each other. Intended for application to means of transport.
- ✓ Very long-term film, negligible shrinkage.
- ✓ Water and aggressive environment proof.
- ✓ Application possible at an ambient temperature starting from +15 °C (+59 °F).
- ✓ By their core nature, the conformable film ensures the application to 3D surfaces.
- ✓ Clear, permanent, pressure-sensitive, solvent-based adhesive, preventing the migration of plasticisers.
- ✓ Film can be easily removed by applying heat and/or chemical products.
- ✓ Compatible with computer-aided cutting.

CONTENT

1. PRODUCT FEATURES:

Multilayered cast film	Gloss or matt surface finish. 100-µm thickness (150 µm for the structured films). The combination of a multilayered cast film and adhesive ensure good conformability properties without colour alteration. Colours stable over time *(see paragraph « Resistance to weathering »)*. Elongation at break, minimum of 120 % (minimum of 40 % for structured films). Very low shrinkage, below 0.4 % over 100 mm (3.94 in.) after 168 hours at 70 °C (+158 °F). Temperature resistance ranging from -40 °C to +90 °C (from -40 °F to +194 °F).
Adhesive	Pressure-sensitive, solvent-based, acrylic adhesive. Peel strength: 1.4 kg (3.09 lb) (25-mm (0.98-in.) wide strip after 24 hours; dry application to glass.) Initial tack on a 25-mm x 25-mm (0.98-in. x 0.98-in.) glass plate, strength 1.6 kg (2.20 lb).
Silicone-coated liner	Embossed and silicone-coated PE paper of 145 g/m², with grey « THE CAST by HEXIS » print. Stable under hygrometric variations. Force of attraction/repelling of the adhesive on the silicone (release), 25-mm (0.98-in.) wide strip: adhesion strength 30 g (0.07 lb).
Transfert tape	For choosing accordingly to application and work habits, HEXIS supply with 7 different quality levels: [paper + latex-based adhesive] [polyethylene + water-based, acrylic adhesive]. [polyethylene + solvent-based adhesive] [micro-structured polypropylene + water-based adhesive].
For more information about the standard trial methods used, please contact our HEXIS Product Support: tel. +33 (0)4.67.18.66.80 or e-mail: assistance@hexis.fr	

2. FEATURES FOR APPLICATION TO AUTOMOBILES:

Excerpts from the SKINTAC HX45000 film tests complying with automobile standards (automobile requirement specifications).

		Duration	Values	Observ.
Shrinkage/ heat	Longitudinal	22 hours at 85 °C (185 °F) on aluminium	0.4 %	Conform
	Transversal	id.	0.4 %	Conform
	Longitudinal	22 hours at 100 °C (212 °F) on aluminium	0.4 %	Conform
	Transversal	id.	0.4 %	Conform
Cold adherence (peel strength)		After 22 hours at 23 °C (73 °F) and 5 hours at -30 °C (-22 °F)	On 2.5 cm (1 in.) wide, to glass 1.1 kg (2.43 lb)	Conform
Hot adherence (peel strength)		After 22 hours at 23 °C (73 °F) and 1 hour at 85 °C (185 °F)	On 2.5 cm (1 in.) wide, to glass 2.8 kg (6.17 lb)	Conform
Frictions (wearing-off resistance)		After 22-hour application, wearing caused by type B fabric bands rotation during 30 min (Standard PSA D141425/B)	No visual alteration of the film	Conform
Behaviour of the adhesive on painted metal sheet (stains)		Application to painted, cooled down metal sheet after 70 hours at 85 °C (185 °F)	No migration at the junction film/coating	Conform

3. RESISTANCE TO CLEANING AGENTS:

	Duration	Values Peel strength on glass	Friction resistance*
Resistance to windscreen cleaners	After 22 hours at 23 °C (73 °F) the samples are immersed in windscreen cleaner for 1 minute, then dried for 30 minutes, then peeled off.	1.3 kg (2.87 lb)	Conform
Resistance to hydrocarbons	After 22 hours at 23 °C (73 °F) the samples are immersed in the mix for 1 minute, then dried for 30 minutes at 23 °C (73 °F).	1.0 kg (2.20 lb)	Conform
Mix: 50/50 Isooctane / Toluene	id.	1.2 kg (2.65 lb)	Conform
Mix: 43 / 43 / 15 Isooctane / Toluene / Methanol	id.	0.8 kg (1.76 lb)	Conform
Initial tack	Immediate on glass	1.6 kg (3.53 lb)	Conform

* After application the vinyl is subject to friction by a 900-g load moving alternately during 10 seconds. A piece of fabric beneath the load is soaked in various solutions prior to the test. After the trial, data are noted on a grey scale for the degradation of the vinyl as well as the resorption of the fabric.

Car washes: The additive products and the condition of the rotating brushes may impair the adhesive strength of the films. It is commonly admitted that after 10 car washes, the polyurethane paint becomes streaked; therefore, and in the same way, HEXIS are not accountable for these mechanical effects that may impact the film appearance.

HEXIS warranty does not cover graphics on means of transport that are cleaned with a high-pressure cleaner at a distance of less than 50 cm (19.69 in.) and a water temperature of more than 35 °C (95 °F) with unspecified additives from cleaning stations.

4. COMPATIBILITY CHART OF HEXIS SKINTAC HX45000 FILMS WITH CERTAIN SUBSTRATES:

Substrate	Adhesive strength				Substrate preparation	Prior cleaning	Wet application
	Low	Good	Very good	Excellent			
Painted metal sheet			✓		Degassing and tear-off test	Gentle or medium upon paintwork	No
Unpainted metal sheet (directly on the colour)			✓		Degassing and tear-off test	Gentle or medium upon paintwork	No
Stainless steel			✓			Strong	No
Glass				✓		Strong	No
Polypropylene	✓					Strong	No
ABS		✓				Gentle	No

5. RESISTANCE TO TOTAL IMMERSION:

In a graduated cylinder: Adhesive-coated film applied to a 25-mm x 200-mm (0.98-in. x 7.87-in.) glass plate for 22 hours at 23 °C (73 °F). After immersion the samples are dried.

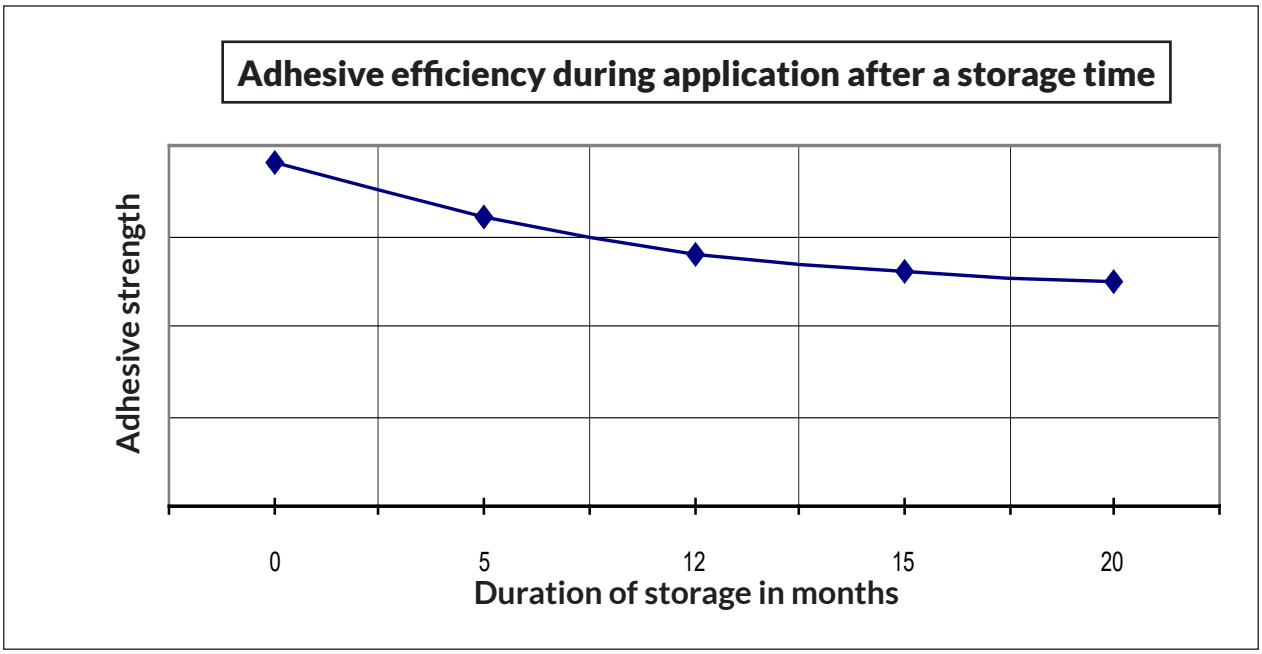
	ELONGATION		ADHESIVE DATA ON GLASS	
	Immersion time	Elongation at break	Immersion time	Data after drying time
Water	> 1000 hours	Normal	24 hours	100 % after 24-hour drying
Salted water	> 1000 hours	Normal	24 hours	100 % after 24-hour drying
Ethylene glycol	24 hours	Normal	1 hour	43 % after 30-min drying
Engine oil	24 hours	Normal + 5 %	1 hour	79 % after 30-min drying
Petrol	24 hours	Normal + 8 %	1 hour	10 % after 30-min drying
Diesel	24 hours	Normal	1 hour	65 % after 30-min drying
Household alcohol	24 hours	Normal + 10 %	1 hour	86 % after 30-min drying
Acetone	1 hour	Normal + 10 %	1 hour	2 % after 1-hour drying

➔ Optimal adherence of the SKINTAC HX45000 films is obtained after 24 hours following application.

6. STORAGE BEFORE USE:

✓ Storage conditions require an ambient temperature ranging from +15 °C (+59 °F) to +25 °C (+77 °F), with relative humidity between 30 % and 70 %, without direct sunlight exposure. It is imperative to store cardboard boxes vertically or to suspend the rolls in order to avoid pressure marks on the carrying zone.

✓ By their nature, adhesives age more or less rapidly before application to their final substrate. The adhesive strength of the above graphic has a tendency to weaken over the storage duration.



✓ This phenomenon affects the adhesive BEFORE application. We would advise not keeping products over a too long period of time and to renew your stock regularly. The maximum storage time is one year in its original packaging from the date of delivery by HEXIS. Beyond that date, the adhesive is still usable albeit with lower performance and under sole responsibility of the user.

✓ The storage duration of this product is 2 years, if it is stored in its unopened original packaging before application, at a temperature ranging from 15 °C to 25 °C (from 59 °F to 77 °F), with relative humidity between 30 % and 70 %.

✓ Pressure-sensitive adhesives preserve the adhesion features at the end of the storage and at the moment of application during the entire warranty period. Any claim questioning the adhesive will only be considered if accompanied with its batch number.

7. COMPUTER-AIDED PRE-CUTTING OF THE FILMS:

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

The pressure of the cutting blade should be adjusted upon the type of film. The colour of the vinyl is determined by colouring additives that may affect the hardness of the film when cutting. Thus when a red film is cut after a white one, the pressure may need to be increased.

7.1. SHAPES CUTTING:

The minimal height depends on the condition of the blade, the pressure and the speed of cutting. Smaller shapes may be achieved by lowering the speed.

A used or worn blade directly relates to the quality of the cut and requires a much stronger pressure. The ease of weeding also depends on it. HEXIS supply blades for the most common plotters.

If the pressure is too high, the protective liner (silicone-coated paper) could slightly crack and the adhesive could penetrate. This would make the weeding process more difficult and the paper liner could even peel off in the cutting area. In any case, it is recommended to weed the material right after cutting.

7.2. CHOICE OF THE TRANSFER TAPE:

The size of the shapes to be transferred as well as the temperature conditions influence the choice of the transfer films or papers to be used. Small shapes and low temperatures require a High Tack tape. After weeding, the application of the tape should be followed by vigorous wiping with a squeegee, particularly on the small shapes.

7.3. TRANSFER OPERATION:

With small shapes, it is preferable to turn the complete assembly sheet/tape upside down (tape beneath, paper liner on top) and to peel off the paper liner while keeping the tape in a flat position.

8. APPLICATION OF SKINTAC HX45000 FILMS:

8.1. REQUIRED EQUIPMENT:

Liquids	Tools	Accessories
› ProTech® SHAMPCAR carrosserie shampoo › "System 1-2-3" cleaning liquids: › 1-Remover › 2-Pre Cleaner › 3-Final Cleaner › Liquid for an easier application: MAGICSPRAY › A specific sealing varnish that complies with construction site standards. › ProTech® cleaning agents	› Squeegees upon your choice from the catalogue › ROLLRIV application wheel for applications over rivets › RIVETBRUSH application accessory for riveted surfaces › PISTHERMIQ heat gun › MALCOV HEXIS tool case	› Adhesive tape Tesa® 7476 › Masking tape

8.2. RECOMMENDATIONS:

› The colour of the films is controlled by HEXIS in order to ensure faithful reproduction of the colour tints. Nevertheless, should your project require the use of several rolls of a single colour reference, HEXIS recommend to you use only one batch number of this colour.

› Avoid applying self-adhesive films to unpainted components such as trims or unpainted bumpers.

› Optimal adherence of the films is obtained after 24 hours following application.

8.3. PRELIMINARY TEST OF THE APPLICATION SURFACES:

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

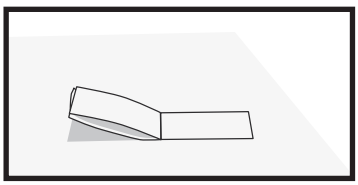
The installer and the client are responsible for the suitability assessment of the target surface to be covered.

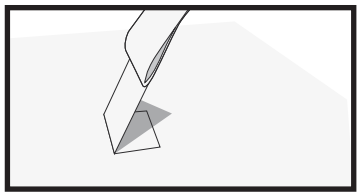
8.3.1. Preliminary inspection of the substrate:

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

8.3.2. Tear-off test:





Using a TESA® 7476 adhesive tape, or the like, apply 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 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.*

8.3.3. Outgassing test:

Use a square piece 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 insufficiently outgassed. Therefore, this process should be repeated after a couple of days; or else the procedure described below should be carried out.

8.3.4. *Outgassing 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 that treatment as this light surface treatment disappears after a few minutes.

> *HEXIS are not liable for any bubbles caused by outgassing.*

8.4. 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 adherence 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 at www.hexis-graphics.com.*

8.4.1. *Clean or soiled surface appearance:*

For vehicle wraps, it is advised to wash the vehicle with the SHAMPCAR vehicle body shampoo, then use the PRE CLEANER (product no. 2).

› Spray it onto the surface.

› Let it work for a few minutes, then wipe it dry with a clean cloth.

› Carry out a final cleaning using the FINAL CLEANER (product no. 3).

Shampcar
Concentrated vehicle shampoo

Pre Cleaner
Powerful universal cleaning agent

8.4.2. *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 (product no. 1).

Work in a ventilated area. Wear protective goggles.

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 (product no. 1).

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

› Then wait for a few minutes. Spray the ADHESIVE REMOVER (product no. 1) again, then wipe it dry with a clean cloth or squeegee.

› When the substrate is clean and dry, clean again with the PRE CLEANER (product no. 2), then finish with the FINAL CLEANER (product no. 3) (as explained above).

Adhesive Remover
Powerful cleaning agent

Final Cleaner
Cleaning and degreasing finishing agent

8.4.3. *Special case:*

Remember to adapt the preparation methods upon 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, clean the substrate with soapy water and then with a cloth soaked with PRE CLEANER (product no. 2), then FINAL CLEANER (product no. 3) in the case of a full wrap.

Refer to the product safety data sheet.

⚠ *Thoroughly wipe the surface after the cleaning process.*

8.5. APPLICATION OF THE GRAPHIC OR SKINTAC HX45000 FILM:

Due to its HEX'Press liner, the HX45000 film must solely be applied according to the so-called "dry" application method.

This HEX'PRESS technology allows easy repositioning of the vinyl on the substrate during application.

However, the SKINTAC HX45000 films must be firmly squeegeed to achieve optimum adhesion to the substrate.

HEXIS advice: To enhance the surface sliding of the squeegee on the film while limiting the risk of micro-folds during this phase, the MAGICSPRAY product can be sprayed on the squeegee surface as soon as necessary, until completion of the film application.

Before any application of the SKINTAC HX45000 film, make sure that all surfaces be clean, paying particular attention to critical areas such as corners and edges.

The perfect application temperature ranges from 15 °C to 25 °C (59 °F to 77 °F) (preferably from 20 °C to 25 °C (68 °F to 77 °F)) and must be respected for both the ambient and substrate temperature.

For the SKINTAC HX45000 series films with structured surfaces (carbon effect) the minimum application temperature is 18 °C (64 °F). Avoid applications in colder environments. Indeed, due to their specific structure, these products tear off easily in cold working conditions.

Hygrometrics may also influence the adhesion of the film to its substrate.

The matt and HX45CA000B carbon effect films (except HX45CA890B, HX45CA891B, HX45CA892B), are sensitive to marking (particularly squeegee marks). They should be handled with the greatest care during their application, notably by respecting the correct inclination of the squeegee. If any traces remain after application, they can be attenuated by slightly heating (max. 90 °C /194 °F) the film surface with a heat gun.

The application of the HX45CA890B, HX45CA891B, HX45CA892B carbon effect films with gloves will be facilitated if you slightly moisten your fingertips.

Caution: Any heating operation indicated below must be carried out with the heat gun or the gas torch by performing sweeping motions at a reasonable distance. The temperature must be checked with the laser thermometer on the film's surface, in the heated area, right after withdrawal of the heat gun's hot air flow.

After a heavy deformation covering, it is necessary to reheat the deformation to a temperature ranging from 80 °C to 90 °C (from 176 °F to 194 °F) in order to ensure reliable long-term film adhesion. In the case of the structured effect SKINTAC HX45000 films (carbon effect), this reheating step must be carried out very carefully (average setting of the heat gun, heat gun always in motion, increased distance between the heat gun and the film). Indeed, excessive heating can lead to the film tearing off.

⚠ *If the heat flow is maintained on a fixed spot or near the surface of the film, it may result in an irreversible deterioration of the product. 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 on).*

8.5.1. First steps and application of the SKINTAC HX45000 film to flat surfaces:

› Wear gloves (available in the tool case).

› Position the printed film on the target surface and tape it into place without stretching it. (FIG. 01)

Figure 01

› Apply a strip of masking tape or magnets across the upper section of the graphic in order to create a horizontal hinge; preferably on a flat part of the surface. (FIG. 02)

Figure 02

› Peel off 10 cm (4 in.) of the liner. (FIG. 03)

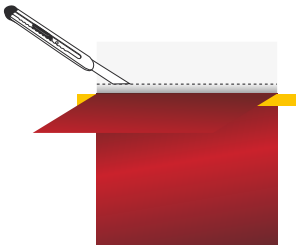


Figure 03

› Start applying the film with a squeegee (previously covered with felt), by forming a 45° angle with the substrate, and by working from the centre towards the edges. (FIG. 04)

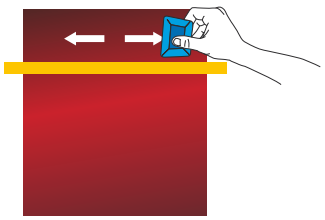


Figure 04

HEXIS advice: To facilitate the surface sliding of the squeegee on the film, the MAGICSPRAY can be sprayed on the surface of the latter whenever needed, until completion of the film application.

› Remove the top hinge and continue removing the liner, depending on the surface pattern (cf. paragraphs below). (FIG. 05)

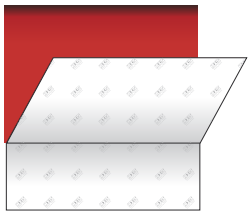


Figure 05

› During application to flat surfaces, squeegee the entire surface and at the same time remove the liner steadily, firmly pressing on the edges and corners.

8.5.2. *Undulated surfaces:*

After having completed step 8.5.1, you may come across slight or heavy undulations for which the application process will be different.

8.5.2.a. Slight undulations: « stretched application »

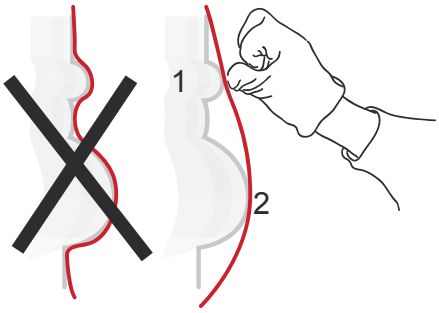


Figure 06

› Remove all the liner.

› Apply the stretched vinyl over the substrate so as to have it stick only to the peaks of the undulation. ((FIG. 06) ① and ②)

› Apply the peaks with a finger or a squeegee.

› Then heat the stretched areas to a temperature ranging from 40 °C to 50 °C (104 °F to 122 °F) with the heat gun (ranging from 30 °C to 40 °C (86 °F to 104 °F) for the HX45CA890B, HX45CA891B, HX45CA892B).

› While continuing to heat the film, press it with your thumb into the hollow of the undulation from both sides so as to properly stick the adhesive.

› Without heating apply the area between the 2 undulations from the centre to the rims.

› Now cut the contours if your undulated substrate has several parts.

› Once the application is finished, heat again all the areas which have undergone heavy deformation to a temperature ranging from 80 °C to 90 °C (from 176 °F to 194 °F) in order to thermoform the product definitively.

8.5.2.b. Pronounced undulations: « extended application »

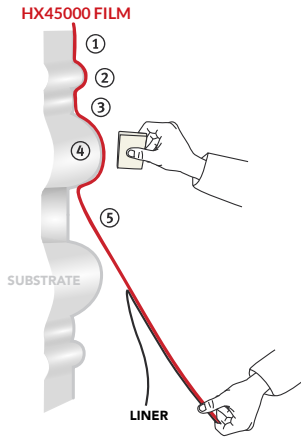


Figure 07

› Gradually remove the liner while pulling it downwards. (FIG. 07)

› Apply the film with the thumb or a squeegee horizontally by progressing slowly into the hollow of the undulation.

› Start applying the hollow ①, then the peak ② and finally the hollow ③.

› Go up onto the next undulation ④, then keep going ⑤ until completion of the application.

› As the film was not deformed, it is not necessary to heat again to 80 °C (176 °F).

⚠ *In the hollow parts, the HEX'PRESS adhesive technology requires sufficient pressure in order to completely expel any air that could remain in the micro-channels. This is because the air that has not been evacuated and that is not visible to the eye may later result in the film peeling off from its substrate.*

HEXIS advice: To enhance the surface sliding of the squeegee on the film, it is highly recommended to spray the application liquid MAGICSPRAY on the surface of the latter whenever needed, until completion of the film application.

8.5.3. *Concave surfaces:*

Any heating operation indicated below must be carried out with the heat gun or the gas torch by performing sweeping motions at a reasonable distance. The temperature must be checked with the laser thermometer on the film's surface, in the heated area, right after withdrawal of the heat gun's hot air flow.

⚠ *If the heat flow is maintained on a fixed spot or near the surface of the film, it may result in an irreversible deterioration of the product. 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 on).*

When step 8.5.1 is finished, proceed as follows.

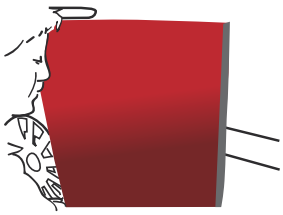


Figure 08

› Remove the whole liner by pulling it off. (FIG. 08)

› Stretch the vinyl over the substrate so that the film touches the peaks only.

› Apply the peak with a finger or a felt-covered plastic squeegee. (FIG. 09)

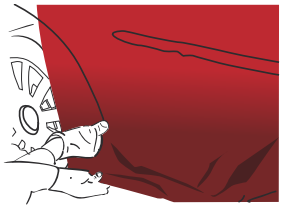


Figure 09

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

› Heat to a temperature ranging from 40 °C to 50 °C (from 104 °F to 122 °F) and press the film with your thumb into the hollow area so as to properly apply the adhesive. (FIG. 10)


Figure 10

⚠ *Caution: HEXIS recommend you to pay particular attention to the application of HEX'PRESS films on concave areas. The HEX'PRESS adhesive technology requires sufficient pressure at the film surface in order to completely expel any air that may remain in the micro-channels Indeed, the air which has not been evacuated from the micro-channels and which is not visible to the eye may later result in the film peeling off from its substrate.*

HEXIS advice: In order to reduce the risk of micro-folds generated during the air evacuation phase, it can be necessary to increase the surface sliding of the squeegee on the film. For this purpose, MAGICSPRAY can be sprayed on the squeegee surface whenever needed, until completion of the film application.

› Once this step is completed, heat again 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. (FIG. 11)

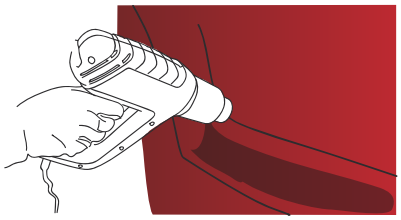


Figure 11

8.5.4. Convex surfaces:

After having completed step 8.5.1, proceed as follows:

› Remove the liner.

› Heat the vinyl to a temperature ranging from 40 °C to 50 °C (from 104 °F to 122 °F) (FIG. 12) (from 30 °C to 40 °C (from 86 °F to 104 °F) for the HX45CA890B, HX45CA891B, HX45CA892B), then stretch the film so as to completely wrap the convex surface. (FIG. 13)

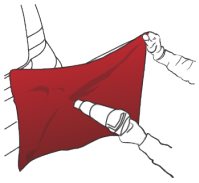


Figure 12

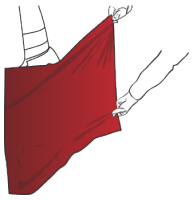


Figure 13

› Apply the film over the whole surface using a felt-covered, plastic squeegee, and carefully wipe over the convex area (FIG. 14) to eliminate any tensions and folds.

› If necessary, lift the film, stretch it again and completely wrap the convex surface, then apply it. (FIG. 15)

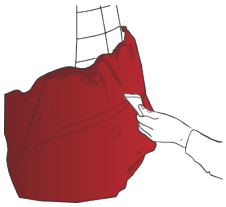


Figure 14

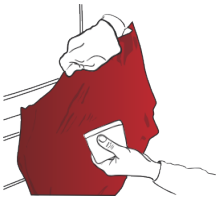


Figure 15

› After this operation, heat to a temperature ranging from 40 °C to 50 °C (from 104 °F to 122 °F) (from 30 °C to 40 °C (from 86 °F to 104 °F) for the HX45CA890B, HX45CA891B, HX45CA892B (FIG. 16) and stretch to eliminate all folds using the squeegee.

› Cut, if necessary, and heat again all the edges to a temperature ranging from 80 °C to 90 °C (from 176 °F to 194 °F).

› The application is completed. (FIG. 17)

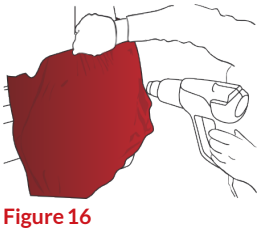


Figure 16

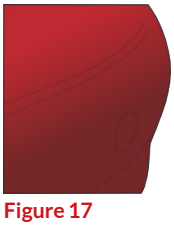


Figure 17

⚠ *As regards the SKINTAC HX45000 films with structured effects (carbon effect), particular care must be taken when heating the stretched film.* (FIG. 12) *to* (FIG. 17) *The hot air gun or the gas torch must never be held at a right angle to the surface of the film. It should be inclined so as to heat a larger surface area. Keep the hot air gun moving all the time. Never heat a small surface area over a prolonged period.*

8.5.5. Riveted surfaces:

After having completed step 8.5.1, proceed as follows:

› When you encounter a rivet, the film is stretched. Gently heat to a temperature ranging from 40 °C to 50 °C (from 104 °F to 122 °F) (from 30 °C to 40 °C (from 86 °F to 104 °F) for the HX45CA890B, HX45CA891B, HX45CA892B). Then dab the rivets with the RIVETBRUSH to apply the film to them.

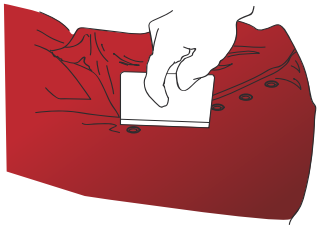


Figure 18

› Then slide the ROLLRIV over the film to make it adhere to the entire rivet surface. Press it all around the rivet using a squeegee or your thumb. (FIG. 18)

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

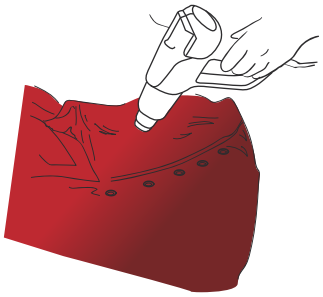


Figure 19

› Then heat each rivet again to 80 °C - 90 °C (176 °F - 194 °F). (FIG. 19)

8.5.6. Overlaps:

If two film parts must be overlapped, it is important to comply with the following instructions in order to ensure optimum adhesion of one film to the other:

› Clean the lower film using a microfibre cloth soaked with HEXIS FINAL CLEANER (product no. 3). Let it dry.

⚠ *If the upper film needs to be repositioned, separate the lower film with extreme care.*

› Apply the upper film. Press down strongly on the overlapped area using your gloved hand or a squeegee while heating the area at around 50 °C (122 °F).

› Avoid applying the SKINTAC HX45000 films to unpainted components such as trim or unpainted bumpers.

8.6. ADDITIONAL INFORMATION FOR A VEHICLE FULL WRAP:

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

› Whenever a horizontal application becomes necessary, as on engine hoods or roofs, this may lead over time to a slight attenuation 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.

› If an overlap of widths becomes necessary, HEXIS recommend 1 cm (0.4 in.), carried out in the following way:

› Horizontal overlap of the SKINTAC HX45000 film: the upper part of the film overlaps the lower part of the film (tiling).

› Vertical overlap of the SKINTAC HX45000 film on a mobile surface: Assuming that you always apply the film starting from the rear of the vehicle and working forward, then the overlapping will be done in the same way. (FIG. 20)

⚠ *If the upper film needs to be repositioned, separate the lower film with extreme care.*

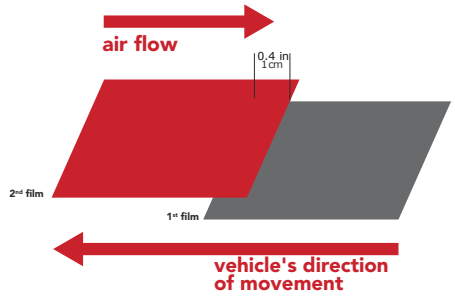


Figure 20

› Avoid applying the SKINTAC HX45000 film to unpainted components such as trim or unpainted bumpers.

› The first step is the most important and here are some essential advices:

› Make a hinge as indicated above (chapter 8.5.1. First steps and application of the SKINTAC HX45000 film to flat surfaces:, page 9) just above the door handles.

› Cut and remove the liner from the upper part.

› Tension the film and apply it using a squeegee.

› Once the upper part is applied, remove the remaining liner from the lower part.

› Tension the film over the door handles and, using a squeegee, apply the film all around the door handles. Once the door handles are done, tension the film down up to the bottom of the vehicle body. (FIG. 21)

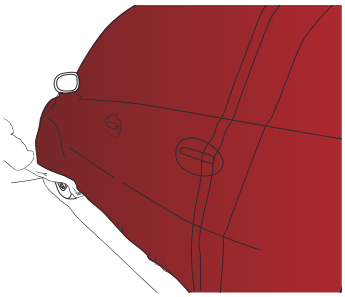


Figure 21

› Do not hesitate to lift and stretch the film to remove any folds. If necessary, heat it to a temperature ranging from 40 °C to 50 °C (from 104 °F to 122 °F) (from 30 °C to 40 °C (from 86 °F to 104 °F) for the HX45CA890B, HX45CA891B, HX45CA892B).

Figure 22

› The film is now stretched over the entire surface area to be wrapped. Now you can apply the film (FIG. 22) according to the type of surface.

8.7. CUTS AND FINISHINGS:

For whichever part to be wrapped, leave a margin of at least 5 cm.
If there is a part adjacent to the one to be wrapped, apply the film over at least 5 cm to the adjoining part.

Then carry out the cuttings and finishings as the case may be.
To avoid scratching the paint, the cutter blade must never be perpendicular to the vehicle body.

8.7.1. Slanting cut:

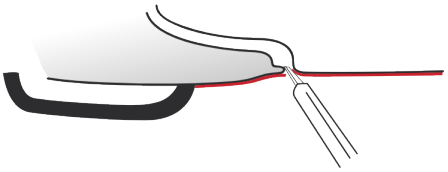


Figure 23

This cutting method should be applied if the recovered part features a thin border and the adjacent part a straight and wide one. (FIG. 23)

This is the case notably for doors and bonnets of means of transport, etc.

› Put on gloves (available in the MALCOV toolbox).

› Use a cutter with a new blade.

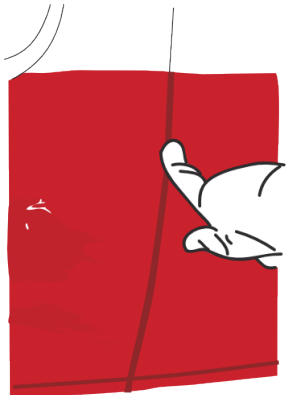


Figure 24

› Trace with your gloved finger the contours of the area. (FIG. 24)

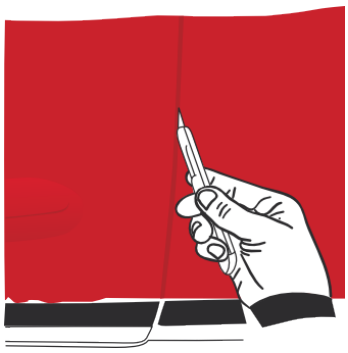


Figure 25

› For carrying out the cutting, the cutter blade must be placed against the thin edge of the part to be covered. During cutting, make sure you always follow this edge by inclining the cutter towards the outside. (FIG. 25)

Figure 26

› To finish, run the squeegee over the cut. Incline the squeegee towards the thin edge. (FIG. 26)

8.7.2. *Straight cut with overlap:*

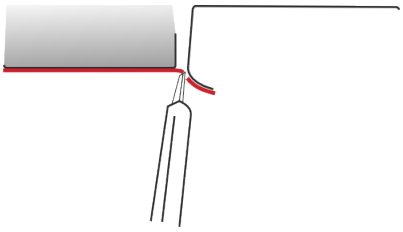


Figure 27

This method must be used when the part to be covered and the adjacent part feature straight edges (FIG. 27). This is particularly the case for the contours of traffic lights, etc.

› Put on gloves (available in the MALCOV toolbox).

› Use a cutter with a new blade.

› Trace with your gloved finger the contours of the area.

Figure 28

› For carrying out the cutting, the cutter blade must be placed against the edge of the adjacent section. During cutting, make sure you always follow this edge. (FIG. 28)

Figure 29

› To finish, run the squeegee over the cut. (FIG. 29)

8.7.3. *Straight cut without overlap:*

This method is used for a cut along a seal.

› Use a cutter with a new blade.

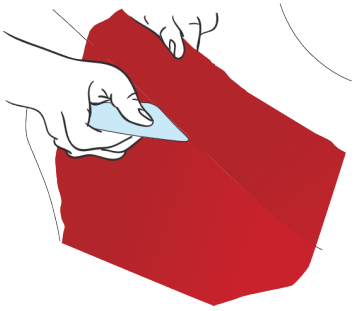


Figure 30

› Trace with your finger the contours of the area. Lift the vinyl of the adjacent part and drag it into the hollow using a squeegee so as to mark the seal edge. (FIG. 30)

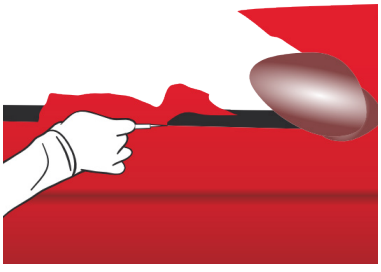


Figure 31

› For cutting, the cutter blade must be placed in a flat position, between the body and the seal, and perpendicular to the seal. Carry out the cutting operation by always maintaining this blade orientation. (FIG. 31)

› Remove any excess vinyl.

› Finish off by running the squeegee over the cut.

8.8. USE OF THE HEAT GUN OR GAS TORCH:

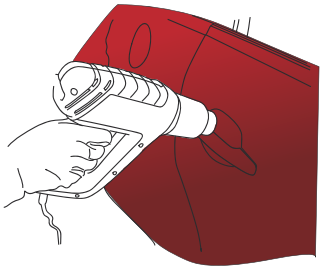


Figure 32

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

When the application is finished, reheat all areas that have undergone heavy deformation with the heat gun (FIG. 32). The temperature should be between 80 °C and 90 °C (176 °F and 194 °F); it must be checked with the laser thermometer (included in the HEXIS MALCOV tool case).

⚠ *Caution: The temperature must be checked on the film surface. 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 on).*

The heat accelerates the bonding process of the pressure-sensitive adhesive. Thus the vinyl is definitely thermoformed.

⚠ *In the case of the structured effect SKINTAC HX45000 films (carbon effect), this reheating step must be carried out very carefully (average setting of the heat gun, heat gun always in motion, increased distance between the heat gun and the film). Indeed, excessive heating can lead to the film tearing off.*

8.9. FINISHING:

At the end of the application, leave the vehicle (or the wrapped component) in an environment with a temperature ranging from 15 °C to 25 °C (from 59 °F to 77 °F), with relative humidity between 30 % and 70 % for at least 12 hours.

Finally check all areas where the film was cut. If the film peels off or wrinkles, apply again the edges under strong pressure using the squeegee.

8.10. SEALING VARNISH:

HEXIS do not recommend the use of a sealing varnish for an application of SKINTAC HX45000 film to means of transport (to avoid any risk of damage to the vehicle body).

However, in certain cases such as SKINTAC HX45000 films applied to trains or heavy machinery, a railway sealing varnish (or authorised varnish for the application stated above) will be required to reinforce the film edges.

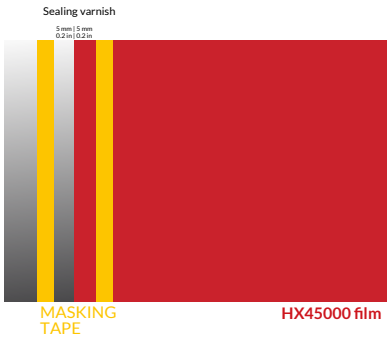


Figure 33

› Ensure that all surfaces are completely dry.

› Apply 2 strips of masking tape:

- 1 to the substrate at 5 mm (0.2 in.) from the SKINTAC HX45000 film.
- 1 to the SKINTAC HX45000 film at 5 mm (0.2 in.) from its edge. (FIG. 33)

› Wear gloves and protective goggles and apply the varnish with a brush in one single coat.

› Remove the masking tape 15 minutes after application.

› The drying time is variable depending on the thickness of the varnish coat and the surrounding temperature: for a film with an average coat, the optimum drying time is 24 hours. Any physical aggression (cleaning, abrasion, etc.) must be avoided by all means during that period of time.

⚠ *By all means avoid contact between the varnish and the window seals.*

8.11. CLEANING AND MAINTENANCE OF THE SKINTAC HX45000 FILM:

The SKINTAC HX45000 film can be cleaned in any conventional automatic car wash, using cleaning products and detergents used for professional maintenance of means of transport and advertising equipment. Nevertheless exercise care when cleaning: medium pressure at a distance of at least 50 cm (20 in.) and a water temperature of 35 °C (95 °F) at the most.

To maintain a perfect finish over time, the HX45CA890B, HX45CA891B and HX45CA892B carbon effect films may require more frequent cleaning than other films of this range.

It is mandatory to carry out the cleaning finish of smooth and glossy films with the LASERWASH ProTech® product distributed by HEXIS.

› Spray directly onto the surface (± 40 cm x 40 cm / 15 in. x 15 in.).

› Wipe with a microfibre cloth before the product dries.

⚠ *However, the film should not be cleaned within the first 48 hours following its application as this can affect the adhesive strength that may result in the film peeling off.*

The LASERWASH ProTech® product can also be used for the regular cleaning and maintenance of smooth and glossy films.

⚠ *Solvents and corrosive detergents must not be used.*
HEXIS are not liable for any adhesive films cleaned with the unspecified additives from cleaning stations.

⚠ *Car washes: The additive products and the condition of the rotating brushes may impair the adhesive strength of the films. It is commonly admitted that after 10 car washes, the polyurethane paint becomes streaked; therefore, and in the same way, 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 surface to be covered.

8.12. REMOVAL PROCEDURE:

The SKINTAC HX45000 films feature a permanent adhesive and therefore their 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).

› Lift the corner gently with the cutter – available in the tool case – without damaging the substrate, and gradually remove the film previously heated; the film should form an angle of 70° to 80° relative to the substrate.

⚠ *An angle more or less wide or acute 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 (product no. 1) and rub the surface until all traces disappear.

› The manufacturer's recommendations for use should be followed to remove the sealing varnish.

⚠ *Prior to treatment, run a compatibility test on a small, inconspicuous area of the substrate to be treated. Indeed, certain plastic materials, sealing gaskets, etc. might be damaged by the cleaning agents. Take the necessary measures to protect the most sensitive parts before cleaning. 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.*

9. RESISTANCE TO WEATHERING:

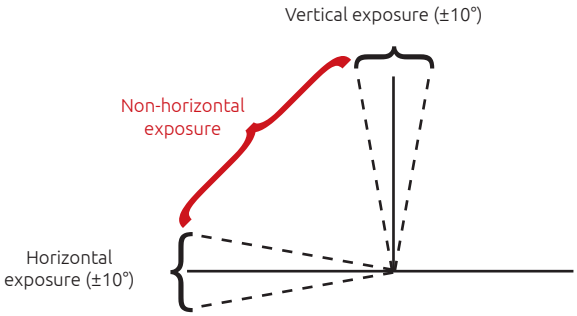
The indications in the table below have been confirmed by accelerated ageing tests with a Xenon lamp according to a protocol required by the automative industry ('FLORIDA' test, see details below).

Dominant colour	Withstand during accelerated test*	Vertical exposure(1)	Non-horizontal exposure(1)	Horizontal exposure(1)
Range 1: white, black (gloss)	6 400 h	12 years	6 years	4 years
Range 2: other colours (gloss)	4 800 h	10 years	5 years	3 years
Range 3: variochrome, iridescent pearly	4 800 h	8 - 10 years	4 - 5 years	2 - 3 years
Range 4: structured	4 800 h	10 years	5 years	3 years

These durations estimate the period during which the film keeps a correct appearance under normal use conditions at the customary observation distance. (A slight and progressive modification of the colour and brightness is a natural and unavoidable phenomenon inherent to the natural degradation of materials.)

A frequent exposure of the HX45000 to a high level of pollution (airborne particles, solvents, hydrocarbons, etc.) may impair the lifespan of the film.

As indicated in the table, the positioning of the film affects its rate of ageing. Here are the differences between the exposure inclinations.



These data are valid for the geographical zone 1. The durations must be multiplied by a factor of 0.65 for the geographical zone 2 and 0.35 for the geographical zone 3. See below the ranking of countries and areas by geographical zone.

Geographical area 1:	Geographical area 2:	Geographical area 3:
Andorra, Armenia, Austria, Azerbaijan, Belorussia, Belgium, Bosnia- Herzegovina, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, metropolitan France, Georgia, Germany, Greenland, Hungary, Island, Ireland, Italy (north of Rome), Kazakhstan, Latvia, Lichtenstein, Lithuania, Luxemburg, Moldavia, Montenegro, Norway, the Netherlands, Poland, Romania, United Kingdom, Russia, Serbia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine, USA (except states listed in area 2).	Afghanistan, Albania, Argentina, Australia (southern States), Bahamas, Barbados, Belize, Bangladesh, Bhutan, Burma, Bolivia, Brazil, Bulgaria, Cap-Vert, Caribbean islands, Chile, Chine, Cooperative Rupublic of Guyana, Cuba, Cyprus, Colombia, Costa Rica, Crete, Ecuador, El Salvador, Fiji, French West Indies (Guadeloupe, Martinique...), Greece, Guatemala, Guyana, Haiti, Honduras, India, Indonesia, Italy (south of Rome), Jamaica, Japan, Kampuchea, Kirghizstan, Korea, Laos, Lesotho, Macedonia, Malaysia, Maldives, Malta, , Mongolia, Nepal, Nicaragua, New Zealand, Pakistan, Panama, Papua-New-Guinea, Paraguay, Peru, Philippines, Polynesia, Porto Rico, Portugal, Dominican Republic, Sardinia, Singapore, South Africa, Spain, Sri Lanka, Surinam, Swaziland, Syria, Tajikistan, Taiwan, Thailand, East Timor, Turkey, Turkmenistan, Uruguay, USA (Arizona, California, Florida, Nevada, New Mexico, Texas, Utah), Uzbekistan, Venezuela, Vietnam, West Indies.	Algeria, Angola, Australia (northern and desert states), Bahrain, Benin, Botswana, Burkina Faso, Burundi, Cameroun, Central African Republic, Chad, Congo, Democratic Republic of Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Iraq, Iran, Israel, Ivory Coast, Jordan, Kenya, Kuwait, Lebanon, Liberia, Libya, Madagascar, Malawi, Mali, Morocco, Mauritius, Mauritania, Mexico, Mozambique, Namibia, Niger, Nigeria, Oman, Palestine, Qatar, Reunion Island, Rwanda, Senegal, Saudi Arabia, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Tunisia, Uganda, United Arab Emirates, Western Sahara, Yemen, Zambia, Zimbabwe. All desert areas. Areas in altitudes above 1000 m (3300 ft).

(*) Details of the accelerated ageing test:

Equipment	Accelerated weathering tester with Xenon ATLAS and QLAB lamps
Test	**FLORIDA**
Illumination	0.52 W/m2 @ 340 nm
Chamber temperature	40 °C (104 °F)
Dry period (102 min)	BST temperature 70 °C (158 °F), humidity 70 %
Damp period (18 min)	Watering
Cycle	362.5 kJ ➔ 200 hours
Equivalence	8 cycles ➔ 1 year in horizontal position

10. HEXIS WARRANTIES:

✓ All HEXIS products are subject to the general terms of sale. Moreover, HEXIS warrant their films for 1 (one) year during storage from the product receiving time.

This warranty takes effect from the date the material is received by the customer, against manufacturing, material and packaging defects[2] (except claims due to damages caused during shipping), complying with the conditions listed in the 'HX45000 specific standard' warranty document[3]. For further information, please refer to the HEXIS Company (assistance@hexis.fr).

✓ After application: HEXIS warrant[4] their HX45000 films against yellowing and crackling[5]:

	Vertical exposure	Horizontal exposure
Terrestrial means of transport	5 (five) years	2 (two) years
Nautical means of transport	3 (three) years	2 (two) years

The warranty against yellowing and crackling[5] takes effect from the date of implementation of the product by the customer, complying with the conditions listed in the 'HX45000 specific standard' warranty document[3].

'Extended' Warranty:

✓ Under the condition that an extended warranty contract between the customer and HEXIS has been concluded.

This warranty takes effect from the date the material is received by the customer, complying with the conditions listed in the 'extended' warranty document[3]. For further information, please refer to the HEXIS Company (assistance@hexis.fr).

REACH (REGISTRATION, EVALUATION, AUTHORIZATION AND RESTRICTION OF CHEMICALS):

The SKINTAC HX45000 series complies with the European Chemicals Regulation (REACH 1907/2006).
To date, the SKINTAC HX45000 series does not contain any concentration of Substances of Very High Concern (SVHC), referring to human health or environment, exceeding 0.1 % weight by weight (w/w).

RoHS (Restriction of the use of certain Hazardous Substances) :

The SKINTAC HX45000 series complies with the European Standard 2002/95/EC and its amendments.
The SKINTAC HX45000 series is free of mercury, cadmium, lead, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE).

NOTES:

(1) The durabilities indicated in this document do not constitute a binding warranty. They are an estimate of the duration during which the film keeps a correct appearance at the customarily observation distance.
(2) Provided that the reported defect is recognised as such by HEXIS.
(3) Documents available on our website at www.hexis-graphics.com.
(4) HEXIS's warranty does not apply in any circumstances in the case of proved yellowing and crackling caused by a frequent exposure to a high level of pollution (airborne particles, solvents, hydrocarbons, etc.).
(5) The warranty against yellowing and crackling applies automatically to all colours displayed in the catalogue as well as to the requested colour tint creations which have been qualified from the accelerated ageing tests.
The measuring methods for the standards quoted above served as basis for the development of our own measuring methods which are available on request. Please feel free to contact us to get the latest instructions currently in use.
All the published information is based on measurements regularly performed in the laboratory. It does not however constitute a binding guarantee. The seller cannot be held liable for indirectly related damages and assumes no liability for claims that are higher than the replacement value of the purchased product. Due to the great variety of substrates and the growing number of new applications, the installer must check the suitability of the media for each application.
All specifications are subject to potential changes without prior notice. Our specifications are automatically updated on our website www.hexis-graphics.com.

www.hexis-graphics.com

HEXIS S.A.
Z.I. Horizons Sud - CS 970003
F - 34118 FRONTIGNAN CEDEX
FRANCE
Tel. +33 4 67 18 66 80
E-mail: assistance@hexis.fr

ANNEXES

SKINTAC HX45000

RANGE 1

HX45002B LAPLAND WHITE | HX45003B GLACIER WHITE | HX45889B CHARCOAL BLACK | HX45890B DEEP BLACK

RANGE 2

HX45108B LEMON YELLOW | HX45109B BUTTERCUP YELLOW | HX45016B HONEY YELLOW | HX45165B ORANGE RED | HX45485B TOMATO RED | HX45495B URBAN ORANGE | HX45186B RUBY RED | HX45200B BRIGHT CARDINAL RED | HX45220B FUCHSIA | HX45218B PINK CANDY

HX45008B PLUM VIOLET | HX45GO10B BYZANTINE VIOLET | HX45348B EMERALD GREEN | HX45375B KIWI GREEN | HX45532B DARK NAVY BLUE | HX45281B LIGHT NAVY BLUE | HX45905B PITCH BLUE MET | HX45280B SAPPHIRE BLUE | HX45300B VIVID BLUE | HX45293B INTENSE BLUE | HX45299B OLYMPIC BLUE | HX45035B TI BLUE

HX45034B TAXI BEIGE | HX45468B IVORY | HX45476B BROWN | HX45894B MARRON CAFÉ | HX45428B OYSTER GREY | HX45G006B SATURN WHITE | HX45445B DARK GREY | HX45446B TRAFFIC GREY | HX45948B BRONZE GREY | HX45G895B BLACK SPARKLE

RANGE 3

HX45PE771B BOREAL WHITE | HX45PE916B PAYNE'S GREY | HX45PE774B SCARAB GREEN VIOLET

RANGE 4

HX45CA890B BLACK CARBON | HX45CA891B RAVEN BLACK CARBON | HX45CA892B BLACK OIL CARBON