

Heat-setting

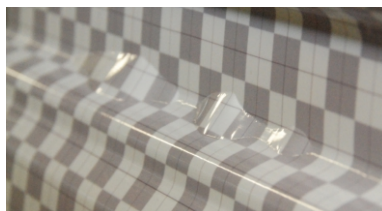
part 1

MORE IMPORTANT THAN EVER

Heat-setting of the vinyl is an absolute necessity.

More and more signmakers are taking on vehicle wrapping, which means that they have to apply vinyl in 'difficult' spots, such as channels and swage lines, using a hot air gun or blow dryer. (A)

The complaints are increasing, too! The films are causing problems; they lift from the paint, especially in channels and in other critical areas. we are proud to be of help with the right answers.



It's becoming more and more common for vinyl film to lift out of the grooves. The risk factors nowadays are manifold. Think about the various types of ink, water-based car paints and overlaminates, for example.

The demand for cast film has started to increase again. Large-format digital print on vinyl has made it possible to completely wrap vehicles, thus creating the need to apply the film in channels and indentations. This has increased the likelihood for trouble!

„How can that be? I've tried several brands and types of vinyl; they all lift in places. Some immediately, some after several days“. Many a signmaker is at his wit's end, and turns to us for advice. Which is the reason for this article: we want to give a detailed explanation of the

problem and present you with a solution. But is this true? Are those really the reasons?

Various factors

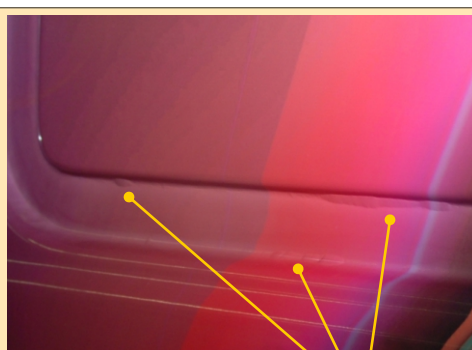
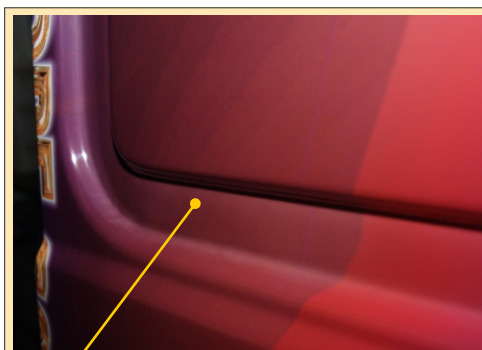
At least 8 risk factors play a role in the lifting of film in swages. We discussed one of these, the “water-based car paints”, in detail before (B).

We'll now tackle another very important factor: the post application, in other words, the „heat-setting“ of the film after its application.

SEVERAL FACTORS CAUSE THE SAME ISSUE: LIFTING

There are various reasons for 'lifting' or 'tenting' of the film in critical areas. Here are some:

1. Temperature of environment
2. Condition of the film
3. Quality of the film
4. Treatment of the film (ink, drying time, overlaminate)
5. Adhesion to the substrate (water-based paint and cleaning)
6. Method of stretching
7. Method of heating
8. Post application (heat-setting)



The pictures above are a perfect example of the problem; during the application of the film everything appears to work fine and without troubles. But the wrong temperature during stretching, too much tension in the film and no heat-setting after application, and within three days the problems started to pop up, as can be seen on the picture on the right.

Heat-setting is a necessity

Heat-setting is as important as the proper application techniques. Worse: if you've done everything else right, but NEGLECT the reheating or do it WRONG, problems like these are unavoidable.

The heat-setting process is meant to set the film in the new shape that it is applied in. Tension in the film can be reduced by careful planning, meticulous cleaning and proper application into channels and swages (C) but a certain tension remains, which requires 'heat-setting' to get rid of it.

EXPLANATION:

- (A) Admittedly a little confusing: we sometimes use the term *'hot air gun and blow-dry'* in connection with applying the film. We always mean that the film has to be worked into channels with the heat of a hot air gun or other professional heat source; a blow-dryer is not nearly hot enough.
- (B) An Information sheet on the subject of *'water-based car paints'* is available on our websites. Go to: www.sott-international.com or www.signothetimes.nl and click on Downloads. On request we will send you a copy by mail. Please call one of our sales assistants: +31 499 375 500.
- (C) Applying the film with the least possible stress into a channel or swage isn't as easy as it may seem. An Information sheet on the subject of *'avoid film stress'* is available on our websites. Or better: join one of our Training sessions.

What is heat-setting?

The stress in the film can be removed by 'heat-setting'. The film is virtually 'cast' into its new mould: the channel or swage.

Heat-setting is an art; to do it right, you have to heat the film to the casting temperature: 210 °C ! But only the film itself, not the adhesive, and only for a split second.

With a heat gun it is possible but to a maximum heat of 90 °C. With a Blowtorch you have quicker result. It's better, easier and much more faster.

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Heat-setting

part 2

MORE IMPORTANT THAN EVER

Heat-setting of the vinyl is an absolute necessity.

Taking the stress out of it

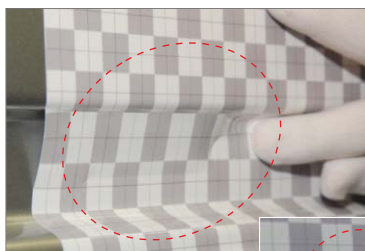
There is stress in the film, since it's been pushed into the channel (see pic). This tension must be removed and the new, stretched shape must become the basic shape. How is that? By casting it again!

Renewed casting!

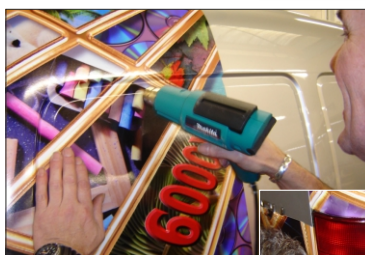
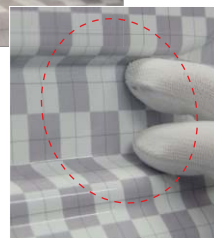
Actually, 'heat-setting' means making the film forget its first shape. You can do this by bringing the film into a situation that is similar to its production process. Simply stated: the vinyl was hot and fluid when cast. After that the vinyl set in its new shape: a thin layer of film. Next an adhesive was added to one side and that was that; the film is produced. So, after applying this film in a different shape, you can simply remove all interior stress by 'casting' the film again. Heating the film (at the spot where the stress is) to casting temperature takes it back to its production state when it was cast. Now work the film thoroughly one more time. If the softened vinyl has set again, it will have accepted the shape of its substrate as its own and the stress will have been removed.

Watch out! Not so easy

The casting temperature is quite high (see box below) and you mustn't scorch the film, the adhesive layer and especially the car paint. This is meticulous work.



When the film is worked into the swage it is under the stress. The demo print above shows clearly how the squares are warped by the stretching.



It is very important to 'heat-set' (re-cast) the film in channels and swages. It's also advisable to do this with edges and curves, to avoid curling.



Don't forget to re-squeegee after heat-setting. There are various ways to do this, but what matters is that the film is pressed onto its substrate once more.

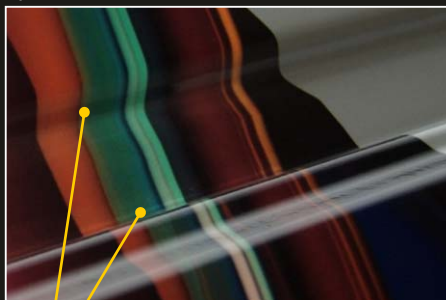
BACK TO THE BEGINNING

It helps to understand the physical characteristics of the film when you are working it into recesses and heat-setting it. Cast film simply is a vinyl blend that is cast at a temperature of 210°C and 'set' into a 2 mil film.

For the film to stick to any new shape (after pushing it into a recess) and make it lose its 'memory', thus removing the interior stress, the film has to be heated to its production temperature: approx. 210°C.

This way you could say you're casting it again, this time in its new shape.

Squeegee the film once more before it cools off, after which the new shape will have been achieved.



The film is virtually 'cast' into its new mould: the channel.

Don't heat the adhesive, but do heat the film?

YES, INDEED!

Some wrappers and signmakers using a heat gun with heat detector to heat-set the film. But this is not the best system. Why not?

- The film may still not reach casting temperature.
- On the other hand the adhesive gets too hot; this layer should not be reheated.
- Also, the car panel gets hot; the bonding between car body, paint and adhesive is weakened.
- There is still a risk of lifting.

Admittedly it is possible with a heat gun. See pic on the left. But there is a much faster and better way.

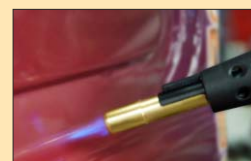
Heat-setting is an art; ideally only the vinyl, not the adhesive, is reheated to 210°C. Short, quick heat blasts with a blow torch are the solution.



Pros have been using these blow torches for years.

400-BB-2235

A blow torch is light, mostly ignited with a button push and they reheat the top layer of the film to 210°C in a split second! Before the heat can travel into the adhesive layer, the flame is gone and you can squeegee the film one last time. Done!



OUR ADVICE

Use a cyclone burner. There is a whole package of advantages:

- at least 60 cars per cartridge
- very safe; works like a lighter
- no electric power required
- can be used upside down
- immediate heat

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