PROPERTIES OF STATIC CLING

Static cling vinyl products are a unique plastic that likes to stick to glass without an adhesive. The name implies some kind of electrical discharge or an electrical attraction that makes the plastic film bond to a glass surface. While not an electrical property that causes bond to glass, the adhesion system is still somewhat magical. Static cling vinyl is a highly plasticized vinyl compound that is extremely soft. This formulation of the vinyl resin allows it to wet out a smooth surface such as glass and achieve bond. This bond, while low compared to a pressure sensitive adhesive, is enough to support the film on glass under ambient conditions. Using this property, static cling vinyl allows a printer to produce a temporary decal that is ideally adaptable to short term messages that can be applied and removed quickly. If handled with care a static cling graphic may be removed and reused. This property makes static cling vinyl a prime candidate for temporary window graphics for point of purchase decals, short term promotions and temporary directional decals.

PROCESSING STATIC CLING VINYL

Common printing processes for static cling vinyl are screen, offset and digital. Normally for screen printing non topcoated static cling is recommended for solvent borne inks and UV curable inks. When printing offset, if the ink chemistry is UV curable non topcoated static cling is recommended. If using conventional offset inks, then topcoated static cling is required. When digitally printing static cling vinyl, eco solvent, UV curable and latex chemistry are compatible with non topcoated static cling.

While the very soft vinyl formulation provides the bond necessary to adhere to a smooth surface it can also induce challenges to the printer. The high plasticizer content makes the selection of the ink critical for success. A common challenge of high plasticizer content is low surface energy that can effect ink bond and printability. First of all contact your ink supplier to be sure you are using the correct ink for static cling vinyl. Secondly, the age of the cling vinyl is critical for successful printing. The useful shelf life of the surface of static cling vinyl for most inks is three (3) months or ninety (90) days. Thirdly, storage conditions of static cling vinyl before printing is also critical. High heat will induce plasticizer migration that will negatively impact ink bond and printability by further lowering the surface energy of the vinyl film. Storage conditions over those three (3) months should be as cool as possible with 70° F preferred. Finally a static cling decal requires a smooth clean surface to build adequate adhesion. All windows or application surfaces must be cleaned with a commercial window cleaner before application of a static cling graphic. Keeping these factors in mind will greatly improve your success in consistently printing and applying static cling vinyl.

USES OF STATIC CLING

Use of static cling vinyl has evolved over time. The original use in applications to glass is still the primary application of static cling vinyl for temporary graphics. These graphics may be one sided or two sided, clear or white static cling film. Both interior and exterior applications are done using static cling vinyl. When considering exterior applications the effects of weathering must be taken into consideration. Static cling vinyl can be processed into privacy film for window and door applications. Printed or embossed static cling will diffuse light providing limited see through while still allowing enough light to brighten a room. Static cling vinyl can also be considered as a protective film when shipping glass, manufactured products or electronic components that need surface protection. Other smooth surfaces such as plastics and paint can be considered as application surfaces for a static cling decal. However, through testing is needed for each individual surface and application.

General Formulations is a leading supplier of static cling vinyl for graphics applications. Static cling vinyl can fill a need for temporary signage in specific applications if you know the advantages and limitations of this product. For your specific applications consult with your General Formulations customer service representative for the correct static cling vinyl product.

CAUTIONS WHEN USING STATIC CLING VINYL

Occasionally there are reports of premature delamination of a static cling graphic from a window. This usually occurs less than a month after application. It starts with an edge curling in to the printed surface and eventually enough mass of the graphic delaminates causing total delamination of the graphic from the window. There are a few commonalities General Formulations has observed in conjunction with premature delamination:

- Dark colors cut to the edge of the graphic, black, dark red, blue.
- Heavy ink coverage or saturation.
- Usually associated with UV curable inks.
- Heavy residual ink odor to the graphic.
- Accelerated by direct solar radiation.

Edge delamination is initiated by thermal cycling induced by the infrared component of solar radiation. Temperature of a dark ink area of a graphic has been measured in excess of 130° F on a clear sunny day in the winter when the ambient temperature is in the 20's. This thermal cycling causes dimensional changes in the static cling that will weaken the already low bond to the glass. High temperature also further cures any residual ink inducing a shrink to the ink side of the static cling vinyl. Continual thermal cycling and surface shrinkages exceed the bond to the window allowing the static cling to delaminate, scroll up and fall off.

There are some measures that can be taken to reduce the possibility of delamination:

- Be sure the window is as clean as possible before application.
- Ink is cured according to ink supplier recommendations.
- A border of non-printed static cling is recommended around the graphic, especially if a dark color is at an edge of the graphic.