

## **BILD SF (SHEET FED) DESCRIPTION**

The BILD SF clear polyvinyl substrate is a multi-purpose material used in a variety of applications such as retail/POP, floor mats, counter top mats, pole wraps, trade show booths, anti-fatigue mats, temporary wall graphics and so much more. The sheet has two sides; the printable back side is smooth where the image would be second surface printed and overprinted with opaque white ink. The top side, the non-printing side, has a slight ridge pattern that can be detected by running a finger nail gently across the surface.

## **STATIC ELECTRICITY**

Static electricity becomes a problem when printing plastic substrates in an environment with low humidity. Static buildup can prevent the separation of the sheets and consistent feeding of the sheets into the press; poor jogging and jams may occur in the delivery.

Issues from static electricity will be minimized if relative humidity is maintained around 45%-55%. Static eliminators such as air ionizers and grounding tinsels will help remove static, but do not eliminate it.

## **TESTING ADHESION**

Adhesion of UV inks can be tested using a piece of 3/4 or 1 inch Scotch 610 or 810 tape (the 610 tape has stronger adhesive). Several inches of the tape are adhered to the cured ink or coating and the tape is firmly pulled off and checked for ink/coating delamination. The tape pull test is a quick and easy check for adhesion (see ASTM F2252 / F2252M for a description).

## **FADE RESISTANCE**

A consideration when selecting ink is the degree of fade resistance to UV light. If the BILD SF product is to be used outdoors or indoors near a window, UV light can fade or burn-out the pigments causing a color shift. Inks where UV light exposure is possible should be ordered with fade resistant pigments. Even fade resistant inks will often change color in less than a year.

## **DYNE LEVEL, PRINTABILITY, AND ADHESION**

The surface of the smooth, printable side has a dyne level of around 32. Low dyne levels on plastics can cause problems with ink printability (ink film depositing smoothly) and adhesion. Some ink formulations may print and adhere adequately to the untreated surface. UV-curable inks generally require higher dyne levels for good printability and adhesion. A common practice on plastics with low dyne levels is to use an adhesion primer (varnish). The primer is applied to the entire sheet and dried before the process inks and opaque white is applied. Inks and/or adhesion primer combinations should be tested prior to printing. Some ink manufacturers will lab test ink compatibility with the actual substrate. Not all types of plastics have the same additives and print characteristics, and general ink recommendations may not guarantee compatibility.

## **PREPRESS RECOMMENDATIONS**

The BILD SF substrate should be run with UV inks. The prepress file preparations including TAC (total area coverage), line screen ruling, and any application of UCR (under color removal) or GCR (gray component replacement) should be the same as those used for coated paper. The general recommendation is a TAC of less than 250% and a line screen ruling of 150 lines per inch.

## **PRINTING RECOMMENDATIONS**

The BILD SF sheets should be conditioned to your pressroom temperature before printing. This can take 24 hours or longer depending on the temperature of the substrate when received.

The BILD SF sheets should be printed on a UV-enabled sheetfed offset press with UV-curable inks that are known to be compatible with the BILD SF product. Due to a dyne level of 32, adhesion of the ink to the plastic may be an issue. Some ink manufacturers recommend a UV adhesion primer to increase the dyne level and improve ink adhesion. The adhesion primer should be printed and cured before printing process color inks. This can be achieved by printing the adhesion primer on the first unit and curing it with an interstation lamp before printing the process inks. The adhesion primer can also be applied on a separate pass. The process inks should be cured and two hits of opaque white applied on top of the printed image. Curing the first layer of opaque white with a lamp is recommended so that the second hit of opaque white is dry trapped.

We do not recommend printing BILD SF with conventional sheetfed inks. Multiple ink films with long drying times on plastic, and a substrate thickness requiring small delivery piles/racking, make conventional inks impractical. There is also risk of the sheets sticking together.

## INK/WATER BALANCE ON PLASTIC

Printing on a non-porous substrate is more difficult than printing on paper or board. On porous surfaces such as paper, some fountain solution is transferred to the blanket and then absorbed into the substrate. This wicking action helps remove excess fountain solution and maintain good ink/water balance. With non-porous substrates such as BILD SF, none of the fountain solution is absorbed.

Excessive buildup of fountain solution on the plate can result in too much fountain solution being emulsified into the ink. With conventional inks this may cause drying times of several days or more. Maintaining ink and water balance is especially difficult on jobs with light ink coverage.

The ink/water balance “window” is smaller when printing on plastics. Success depends on good ink/water balance—running a minimal amount of fountain solution with the thinnest film of ink needed to achieve the solid ink densities. Being able to maintain good ink/water balances is dependent on the press being well maintained. Inking and dampening rollers must have the correct durometer (hardness), be set correctly, and not be glazed.

## INK RECOMMENDATIONS

The following inks have been tested for adhesion and printability with BILD SF and are recommended by the ink manufacturer:

### BRADEN SUTPHIN INK

721V0536 UV Flood Coat Ink Primer (must be run dry offset)

K4694 UV X-Cure Sil Free Black Plastic  
B76081 UV X-Cure Sil Free Cyan Plastic  
R75364 UV X-Cure Sil Free Magenta Plastic  
Y71966 UV X-Cure Sil Free Yellow Plastic

### WIKOFF COLOR

SCUV-12607 XLF Perm PC Black  
SCUV-13590 XLF Perm PC Cyan  
SCUV-12443 XLF Perm PC Magenta  
SCUV-12575 XLF Perm PC Yellow  
SCUV-16534 UV Opaque White (High adhesion)  
Formulated for 300 hours fade resistance

### FLINT GROUP

UV adhesion was adequate without primer, better with primer.

UV Duracure Series  
WWUL-007U Primer  
WWUV-978U Black  
WWUV-578U Cyan  
WWUV-378U Magenta  
WWUV-178U Yellow  
V75X-0X2U Opaque White

### TOYO INK

35581946C5 or 35581946K1 UV Litho Vinyl Primer  
00473514C5- UV PST Dense Black JP LT  
00400202C5- UV PST Yellow TM LT  
00420204C5- UV PST Cyan TM LT  
00410203C5- UV PST Magenta TM LT  
10481576K1- UV PST Opaque White HF1  
00483178K1- UV HS Opaque White

## SUMMARY

BILD SF is a durable polyvinyl for floor graphics, counter top mats, pole wraps, POP displays and much more, all of which can be successfully printed by following these guidelines:

- Reverse print or second surface printed on the back side of the sheet.
- Use a UV-enabled press with UV-curable inks.
- Generally follow the same prepress considerations as you would for coated paper. Keep total area coverage below 300%.
- Consider using an adhesion primer to avoid problems due to the low dyne level. The primer should be cured before printing process color inks.
- Two hits of opaque white are needed on top of the printed image.
- Controlling ink/water balance is crucial. Too much fountain solution and/or ink will create problems.
- Keep an eye on the relative humidity (RH) of the pressroom. Levels below 30% are likely to cause major feeding and delivery issues.
- Use the tape pull test to check adhesion.
- If the BILD SF graphic will be exposed to UV light, especially sunlight, fade resistant inks may be necessary depending upon the required life span of the graphic.
- Testing the compatibility of inks and primer coating with BILD SF is important. It has already been done for you by the selected ink manufacturers above.