

## **Printing on Non-Porous Substrates** **Suggestions for Offset Printing**

Many non-porous substrates are currently used in the printing industry. Plastic, styrene, static cling, polyboards, foils, vinyls and synthetic papers are all synonymous with non-porous substrates. This technical bulletin is to help outline the precautions that should be taken when attempting to print on non-porous substrates.

### **Substrate**

Pre-test and qualify substrate to be used. Ensure the surface energy of the substrate is greater than 40-44 dynes for proper ink adhesion. The Printing Ink Company can assist in testing for dry and adhesion of inks on the substrate to be used.

### **Ink and Driers**

Since there is little or no absorption of the printed ink into a non-porous substrate, inks with 100% oxidizing properties must be used. Oxi-Set NP (Non-Porous) Process and Oxi-Set Pantone inks are suited for non-porous substrate applications. Added driers are highly recommended and can speed-up dry by 50%. Aqua-Dri drier should be added to the ink at the quantity of 3 - 6% and 1-ounce of Ink Drying Stimulator should be added per gallon of fountain solution. Water and ink balance is very critical. Run as little ink and as little water as necessary to ensure the best dry.

### **Pressroom Conditions**

Allow stock to acclimatize to pressroom conditions prior to unwrapping. This will take longer in the winter months than it will in the summer months. Pressroom conditions such as extreme heat or cold and high humidity can cause slow or soft dry on non-porous substrates, resulting in poor rub and adhesion.

### **Spray Powder**

The appropriate grade of spray powder should be used to avoid set-off. A micron size of 30-40 is recommended, as a finer powder will not protect the sheets and a coarser grade may cause scratching.

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### **Fountain Solution**

Use fresh fountain solution, and clean and flush tanks before running the print job on non-porous substrates. Conventional etches with 10-15% Isopropyl Alcohol are recommended. Alcohol replacements are less desired due to the content of glycols that can contribute to slow dry of inks on non-porous substrates. One ounce per gallon of Ink Drying Stimulator is also recommended. Run as little water as necessary, as ink/water balance is critical.

### **Ink/Water Balance**

Run as little fountain solution as necessary, ideally, almost to the point of scumming. Unlike uncoated papers, non-porous substrates will not remove excess water from the blankets and, therefore, the fountain solution will continue to be forced into the ink, causing over-emulsification and retarding dry.

### **Pile Temperature**

The recommended pile temperature is 80-90°F (27-33°C) on the first pass. On the second pass, or underside, temperature should not exceed 80-85°F (27-29°C). Excess heat can cause sheet distortion. Presses equipped with air knives should make full use of its system.

### **Press Feeder**

The use of ion neutralizers or static eliminators is an asset when printing on non-porous substrates. Check the under side of the stock for calendaring, or feed-wheel/sheet guide/tape markings.

### **Press Delivery**

Little or no jogging is desired to eliminate scratching and marking. Wedges must be used with caution. Pile heights are to be determined by size, weight and ink coverage. Recommended pile heights are 3 – 6”.

**For further assistance with printing on non-porous substrates, contact your Rycoline Sales Representative.**