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The Chemistry of Customer Attention

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## **APPLICATION NOTES**

### **Waterbased Scratch-Off Coatings**

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**The information contained in these pages is intended to assist the customer to attain more efficient performance. In addition to those limitations expressed elsewhere in our literature, labels or invoices, these instructions do not further warrant or guarantee performance, which may be affected by the customer's particular use, and the conditions under which the product is used.**

#### **EQUIPMENT**

Usually, Buna-N rubber (well cured nitrile rubber) and photopolymer materials work best as the application pads. Buna N rubber is available from your local supplier or;

**Process Color Plate**  
Chicago  
#1-800-621-1909

**Support Products**  
Effingham, IL  
#217-347-0711

**Ray Schumann & Asst.**  
St. Louis  
#314-645-8700

The pads can be purchased from most flexographic printing plate suppliers. Rubber hardness is best at 30-50 Durometer (40-50 used most). All pads should be ground to exactly the same height or thickness and it is better to have sticky pad on an area larger than the pad impression area.

The pattern gluer must be adjusted so that the application pad just "kisses" the roller from which the scratch-off is applied. This "kiss" is also required when the applicator pad contacts the web. Pressure greater than a "kiss" can cause a ridge or bead at the edge of the scratch-off pattern. Ridges or "halo" effect could cause offsetting, or smearing upon die cutting or excessive staining. This can also cause shear, resulting in slinging and thickening of the product and therefore improper application. Usually a 1 mil (.001") gap between pad and web is preferred.

Suggested anilox is a #65-85 (for example, 65-85 Quad with a cell volume of approximately 30 bcm).

#### **APPLICATION SURFACES**

##### **PAPER**

The web stock used for subsequent scratch-off application is without a doubt one of the most important variables in the process. The scratch-off coating will tend to imbed itself in the uneven, porous paper surface and resist easy scratch-off. As a result, paper substrates can be used only if a proper barrier/release coating is applied under the scratch-

off coating, such as Craigcoat UV Curable Barrier Coatings. Paper stocks should be submitted to our laboratory for evaluation in order to determine the proper barrier coating in advance.

## **FILMS**

For Waterbased scratch-offs, some film substrates may be used without applying a barrier/release coating. Films should be submitted to the lab for compatibility testing prior to using.

## **CONTAMINANTS**

Also, there cannot be any additives or foreign substances on the sheet that will “attach” to the scratch-off and make the coating difficult to remove. Some examples of extraneous substances in or on the surface of the sheet that will sometimes make the scratch-off difficult to remove are:

- ***Press Varnishes:*** Some press varnishes make the scratch-off much more difficult to remove than others. Also, press varnishes should not be used unless thoroughly dried. This usually means two ovens. We suggest not using press varnishes or submitting the varnish coated stock for test by our lab prior to use.
- ***Fountain Solutions:*** Since it has been determined that some of the chemicals in fountain solutions can negatively affect the removability of the scratch-off coating, the printer should check to assure that the scratch-off is coming off cleanly across the entire area of application.
- ***Paper Making Chemicals:*** There are a wide variety of chemicals used during the process of making paper. Some papers are made with certain ingredients that can adversely affect scratch-off removability. For instance, some stocks that are very highly filled with charged pigments (i.e. - calcium carbonates, etc.) can attach certain ingredients in the scratch-off coating to the surface of the paper even though the web stock looks very satisfactory for a scratch-off application.

## **APPLICATION PROCEDURES**

### **MIXING**

Stir the pail of scratch-off material very well before using. As supplied, all wet scratch-off products have a tendency to settle, and therefore, thorough agitation is a must. Mix only for a couple of minutes with a low shear power stirrer. Excessive mixing, especially at high speeds, could bend the metallic particles and reduce opacity, or hiding ability. After mixing, and before running, take a long spatula and scrape the bottom of the pail - if there is nothing on the bottom of the spatula, the scratch off is properly mixed and can be pumped to the pan.

### **PRINTING**

Certain methods of application or printing procedures need special attention if the scratch-off coating job is to come out completely satisfactory.

**a. Sheeting Operations**

In the event that the piece is to be sheeted rather than folded, this must be brought to our attention. Care must be taken to be sure that the scratch-off is suitable for stacking, clamping, and cutting. It is especially necessary to examine the substrate in these cases. We urge you to discuss these jobs with our sales representatives in an effort to eliminate offset and blocking.

**b. Drying the Scratch-Off Coating**

The temperature of the oven should be 320-350°F, which should get the web surface temperature to around 250-275°F. Web temperature should not exceed 300°F. If the scratch-off is not dry, it will smudge when scratching off with a nickel (use this coin because its rim is sharply defined). Another way to check for dryness is to gently rub the scratch-off surface with a white paper towel. If **excessive** smudging appears on the towel, or a dark stain or smudge, it means the scratch-off is not dry. Care should be taken not to overheat the scratch-off coating since it will skin over and area dry, but it actually contains water underneath the cured surface and there will be offsetting.

**c. Cooling and Recirculating the Scratch-Off Coating**

In some cases where pattern gluers are full web width and pans are shallow, and the application patch is small, more shear and therefore more heat may be generated during operation. It is most important, therefore, that the scratch-off liquid is both continuously re-circulated, and also that it is cooled. This will enable the liquid at the rolls to be as close to room temperature (72°F) as possible. This is very important to note. A cover over the scratch off pail will retard water evaporation. If the liquid in the pan gets higher in temperature with time, the water will evaporate and it will increase in viscosity. This will lead to a variety of problems.

When circulating with the aid of a peristaltic or double diaphragm pump, the reservoir should be kept closed and the pail should be covered to avoid skinning and evaporation. When the reservoir needs refilling, be sure to stir contents in the replenishing pail, as described above, prior to filling it.

**d. Viscosity Control and Dilution**

Product should be used as supplied, directly from the pail. Viscosity of scratch-off material should be maintained as received (very important). When a pail is opened and thoroughly mixed, viscosity may be checked with a #5 Zahn cup. Maintain this viscosity. Zahn cup readings should be used only as a press side tool. They are not precise for these products. For accuracy, only a Brookfield Viscometer at the proper RPM & spindle # should be used.

Water will evaporate especially when the pattern gluer runs hot. Avoid over-diluting. Special care should be taken not to combine any scratch-off material with alcohol, fountain solutions, inks, pigments, etc. Dilute waterbased products with water only if needed. A good rule of thumb is no more than 8 ounces of water per pail for golds and 4

ounces per pail for silvers. Check viscosity hourly. Dilution should be only as required and should be checked with a #5 Zahn cup to make sure the viscosity does not drop below specifications. It is suggested to trying “thinning” with more fresh scratch off before trying diluents.

\*\*Should any other diluents be used, it must be checked with Craig Adhesives & Coatings in advance. We cannot be held responsible for use of incorrect diluents.

### **HANDLING AND DISPOSAL**

Containers of the wet scratch-off material should not be left open since they will dry out and therefore change fluidity and machine stability. Products should be kept from freezing and not stored for prolonged periods of time over 90-100°F. Freezing destroys the emulsion, high heat thins the product out too much, and also adversely affects the metallic pigments, which will affect hiding. Inventory should be monitored at all times. Use the oldest pails first. Pails have dates, batch numbers, and safety information etc. on labels. Be concerned if a coating is greater than 6 months old.

Clean up with warm, soapy water, preferably while coating is still wet. Add a half-cup of any liquid dishwashing detergent to a 5-gallon pail of warm water to wash off product.

Use an approved and licensed waste disposal vendor to haul all scratch-off waste. When disposing, be sure the drums are properly labeled and *all* the paper work required by Local, State and Federal law is accurately filled out. Dry or wet scratch-off material can be combined in an approved open head drum. The drum should not be filled more than three-quarters full. The product should *never* be combined in any container with *any* other waste.

For a much more complete and detailed review, the Material Safety Data Sheet and Product Data Sheet specifically prepared for the product number purchased should be consulted.

### **FROM DESIGN AND PRODUCTION VIEWPOINT**

- The message, which the scratch-off is to hide, should be printed with a 30% to 60% screen (30% to 40% is best). Whenever possible, the message should be printed in a lighter color similar to that of the scratch-off over coat.
- The message should be on a white area. Since the scratch-off is being applied over wet ink, placing the message on solid ink or even a screen, makes removal of scratch-off more difficult. Inks with high wax content may be too readily removed when wet and should be avoided.

- Under no circumstances should a job be run where the scratch-off is put down over a full surface of wet ink, even if the ink is screened down. Our coatings will have difficulty scratching off if applied to full area wet ink surfaces.
- Normally, the message will be hidden if the scratch-off coating is applied at approximately 1 mil wet, which is 0.5 mils (0.0005 inch) dry film thickness. If the coat weight is much lower than this, there is danger of getting unacceptable scratch-off properties, including not hiding the message or not being able to scratch off. Conversely, if coat weight is higher, offsetting, blocking, smearing and excessive staining could occur.
- To estimate the amount of scratch-off material required for a job, we have found that a five-gallon pail of scratch-off will cover the following if applied at .0005 inch dry (1/2 mil) film thickness (does not include set-up and waste usages):

<u>Scratch-Off</u>	<u>Weight/Pail</u>	<u>Coverage</u>
Silvers	35 lbs./pail	Approx. 900,000 square inches
Gold	55 lbs./pail	Approx. 1,400,000 square inches

To make everyone's job easier, scratch-off pails are color-coded; yellow for gold and gray for silver.

- Our experience however, is that well controlled applications yield better mileage. Therefore on long runs, orders should be placed on a partial basis. When scratch-off coating is removed with a coin or fingernail, the message will be exposed.

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