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## APPLICATION NOTES

### Solvent 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) works best as the application pads. These resist swelling the best when exposed to naphthas, or other similar solvents. Our solvent scratch-offs are made with naphthas, which swell Buna-N, the least. Buna N rubber is available from your local supplier or;

<b>Process Color Plate</b> Chicago #1-800-621-1909	<b>Support Products</b> Effingham, IL #217-347-0711	<b>Ray Schumann &amp; Asst.</b> St. Louis #314-645-8700
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**\*BASF** now produces photopolymer material that can withstand naphtha solvents.

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. Unless it is an appropriate stock for acceptance of the scratch-off coating, a wide number of problems can be expected. The scratch-off coating will tend to imbed itself in the uneven, porous paper surface and resist easy scratch-off. You must make sure that the paper is smooth and that it will hold out the scratch-off coating rather than let it sink into or absorb into the sheet. Usually, most coated stocks are therefore recommended since the coating presents a surface to which the scratch-off usually does not bond. However, some clay filled-coated stocks can cause problems. Paper stocks should be submitted to our laboratory for evaluation for suitability in advance. Offset or high bulk stock can be used only if a proper barrier/release coating is applied under the scratch-off coating, such as Craigcoat waterbased 6681TW or UV Curable Barrier Coatings. If 6681TW is used, it should be applied at approximately 0.5mils **dry** (1.0mil wet) coating weight. (See *Application Notes for UV Barrier Coatings for Scratch-offs.*)

### **FILMS**

Film substrates cannot be used with Solvent scratch-offs because the solvents tend to “bite in” to the surface. This will result in severe staining and poor release of the scratch-off. As a result, a barrier/release coating is necessary.

### **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. After thorough stirring/mixing with a low shear power stirrer, 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***

There are two procedures that should be avoided for drying our metallic scratch-off coatings. These are *Radio Frequency* and *UV Curing light sources*. The temperature of the web should not exceed 300°F and the dwell time in the oven should be longer than 2-3 seconds. 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 solvent 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 solvent evaporation. If the liquid in the pan gets higher in temperature with time, the solvents will evaporate and it will increase in viscosity. This will lead to a variety of problems.

#### **d. *Viscosity Control and Dilution***

The dilution and clean up solvent is a series of products called Craigsolve 635 (normally 635F). This is a blend of naphthas in the same ratio as in the products. This is used to thin

the scratch-off material and for clean up upon completion of the job. Most blanket washes are naphtha based and can be used **only** for clean up. For dilution, however, (unless there is a serious emergency) “no diluents other than Craigsolve 635F should be used to cut our scratch-offs”.

Viscosity of scratch-off material should be maintained as received (very important). When a pail is opened and mixed thoroughly, 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.

Naphthas will evaporate especially when the pattern gluer runs hot. For solvent products, thin with Craigsolve 635F “only”. When making additions, use small amounts of 635F (4-8 ounces) per pail. Avoid over-diluting. Special care should be taken not to combine any scratch-off material with water, alcohol, fountain solutions, inks, pigments, etc. 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 diluent.

\*\*Should any other diluent 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. Also, if the solvents evaporate into a small and enclosed area, there is a possibility of a fire or health hazard. The product should be used in a fairly well ventilated, non-smoking area.

Solvent Scratch-off materials should never be exposed to flame or sparks from any source. Power mixing should be done with spark proof or air powered mixers only. 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):

<b><u>Scratch-Off</u></b>	<b><u>Weight/Pail</u></b>	<b><u>Coverage</u></b>
Silvers	40 lbs./pail	Approx. 900,000 square inches
Gold	45 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. However, in some cases with some substrates a slight stain or residue will remain. Normally this is not objectionable. Applying a proper UV varnish or other appropriate coating under the scratch-off coating can eliminate this stain.

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