White Paper

A Complete Solution for Credit and Laminated Card Production

Introduction

Credit card companies, banks, retailers and hotels are just some of the brand owners that make a sizeable investment in the manufacture of credit cards and plastic cards. Retail brands today use everything from loyalty cards to rewards cards, point cards, club cards and other inducements to reward buyers for sticking with their brand.

The plastic card industry also extends to companies that develop secure identification cards for employees to ensure safety in the workplace. In all cases, companies, brands and retailers want the plastic cards they manufacture to maintain brand standards and colors.

In 2019, the global card market reached $18.6 billion with more than 37 billion cards manufactured worldwide, according to the International Card Manufacturers Association's (ICMA) Global Card Market Statistics Report. In addition, the market is expected to grow due to the penetration of chip cards, especially in China and India. As of February 2017, chip cards account for 50% of the global market, and this figure is estimated to rapidly expand in coming years.

The implementation of chip cards is a direct result of increasing security challenges in the card market. According to nilsonreport.com, credit and debit card fraud resulted in losses of $27.85 billion in 2019. Identification cards have been easily replicated in the past; governments/businesses have had to spend more to protect their brands and employee identities from counterfeiting.

Due to the wide range of security regulations worldwide, there is increasing demand for polycarbonate as the material of choice for plastic cards, as it creates the most secure, durable and climate-resistant cards in the industry. Additionally, post-consumer and bio-based PVC and PETG are increasingly taking a central stage in card production, as card issuers and brand owners are concerned about their environmental footprint.

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SunChemical®
a member of the DIC group
Color & Comfort

Brand owners depend on plastic cards to be a key source of revenue and brand loyalty, but at the same time, they are required to keep the consumer data stored in each card safe and protected from potential fraud.

Some of the key requirements card manufacturers are looking for during the printing process include:

- strong adhesion of inks and coatings to a wide range of plastic substrates;
- lamination properties that provide strong bond strength and pass ISO specifications;
- inks that cure fast and maintain color consistency with brand standards;
- flexibility to allow for drilling, cutting and embossing without chipping or cracking the card;
- durable and striking lamination plates for functional and eye-catching cards;
- secure and consistent magnetic tapes which can be applied with ease and offer design flexibility;
- the ability to add brand-protection solutions to the cards;
- good lithography performance on printed cards with minimal tacking and blanket swelling;
- high quality pre-laid magnetic tape that offers production flexibility and high cost-benefit balance; and
- highly secure pre-patch holograms that prevent counterfeiting for official documents.

Sun Chemical and its parent company, DIC, can provide a complete solution for credit and laminated card production with a full line of inks, coatings, magnetic tapes, lamination plate solutions and adhesives, in addition to color-matching solutions, anti-counterfeiting brand protection products, pre-laid magnetic stripes in sheets or reels, and pre-patched secure holograms.

Providing Inks and Coatings that Meet All Important Plastic Card Requirements

In the plastic card market, printers and brand owners alike are looking for inks and coatings that easily adhere to all types of plastic and lamination substrates while at the same time maintaining durability. The final printed lamination properties in today's marketplace must pass ISO specifications with a minimum 3.5 N/cm bond strength, and brand owners are pushing for higher bond strength.

Plastic cards must be durable, both during the printing process and when in people's purses or pockets. The inks and coatings that are printed on plastic cards must be flexible, allowing for drilling, cutting and embossing, without the inks chipping or cracking during the card manufacturing process.

Plastic cards can also endure significant abuse after they are printed. Vinyl pouches in people's wallets, for example, have been known to penetrate a card surface and extract the inks/dyes used to print photos and other images. That doesn't include all the skin oils and cosmetics, gasoline and leather-treatment chemicals that could wear down the card's surface.

SunCarte™ Family of Screen and Offset Inks, Adhesives and Varnishes

Brand Name	Type/Products	Features	Benefits
SunCarte UV Offset	• UV-curable offset litho ink system • Four-color process set, blending colors • Special high-density white and dense black	• Optimized resin chemistry • Heat-resistant pigments • Excellent adhesion to a wide range of substrates • Very good litho properties	• Bond strength in excess of ISO standards • Minimal color change after lamination • Robust prints • Optimized press performance
SunCarte UV Plastic Card	• UV-curable screen inks and adhesive • Opaque white, dense black, special clears for printing metallic colors and pearls • UV clear can be used as an adhesive	• UV curing • Optimized resin chemistry • Solvent-free/green solution • Long-flowing ink rheology designed for use on cylinder presses	• Fast print speeds, instant cure, excellent screen stability • High bond strength in excess of ISO standards • No VOCs, no requirement for gas or electric dryers, huge energy savings • Print speeds from 1,000 to 2,000 sheets per hour
SolarSmart ID	• UV-curable screen inks, opaque white and clear	• Optimized resin chemistry • Excellent adhesion to polycarbonate • Super-opaque white • Non-yellowing clear	• High bond strength even with full coverage • Robust prints immediately after curing • Facilitates use for clear and colored core substrates • Can be used as an adhesive or as a carrier for security features

Table 1

Repeated swipes through a card reader can remove features from the card. Moisture, light and delamination are other factors that could affect the durability of the inks on a card.

Formulated for robust lithographic performance and durability, Sun Chemical's **SunCarte™** family of screen and offset inks, adhesives and varnishes (see Table 1) offer high bond strength that meets the demanding ISO specifications, as well as adherence to lamination and other plastic substrates used in the plastic card industry, including PVC, PETG, PET and polycarbonate (PC) core materials. SunCarte can also be customized to deliver various metallic finishes.

The SunCarte product line includes new UV screen inks that offer a variety of finishing options for use on plastic cards. **SunCarte UVPC Opaque White** inks, for example, were specially designed to work on colored PVC core material, while **SunCarte UVPC-Clear** inks can be used to provide pearl, silver, gold and special-effect color finishes. UVPC-Clear also offers adhesive properties, as the ultra-thin cured-ink film minimizes the buildup profile.

The SunCarte offering also includes an **Offset UV Plastic Card** lithographic ink series designed exclusively for use on plastic cards and especially for printing on plastics with subsequent lamination with a transparent overlay film, as used in the manufacture of banking cards, membership cards, ID cards, etc.

SunCarte Offset UV Plastic Card inks offer high bond strength, excellent printability, low dot gain and heat-resistant colors. The inks are also compatible with Sun Chemical's UVPC screen products.

Maintaining Brand Color Consistency with the Sun Chemical Dispenser Program

Brand owners and card printers alike want the right color printed the first time, every time and anywhere at the most economical delivered price possible.

Sun Chemical's SunCarte family of plastic card inks can be used with the **Sun Chemical Dispenser Program** (Figure 1), which is designed to help manage what has typically resulted in an overabundance of spot color inventory and to reduce the possibility of using the wrong spot color.

By using the Dispenser Program, customers are driving profitability by mixing their own spot and process colors in the precise quantities they need. So, inventory costs go down and color accuracy goes up. And, it's all backed by Sun Chemical's world-class technical service team.

Printers can receive these savings and a **GFI MX 12 dispensing unit** along with color repeatability and accuracy, to within 0.001 lb., of their spot colors. The dispensing unit is provided to the printer at no cost by agreeing to purchase a minimum annual amount of Sun Chemical inks.

Printers that sign up for the program will have better control and can provide a faster turnaround to meet the demands of their print jobs, since they don't need to wait for spot color inks to be delivered.

Users of the Sun Chemical Dispenser Program have the ability to mix spot colors much more accurately and reduce operation costs—a win-win for brand owners and printers alike.

Figure 1 *The GFI MX 12 dispensing unit from the Sun Chemical Dispenser Program.*

Security Solutions for Government ID Cards

Sun Chemical now offers pre-patched security holograms for government documents and ID cards such as passports and drivers' licenses. While holograms are traditionally embedded in polycarbonate, Sun Chemical can apply them to a variety of substrates. Layouts and logistic procedures are always tailored to match the specific demands of our customers.

Sun Chemical, through its subsidiary C.T.LAY, operates under best-in-class quality and security control systems. ISO and Intergraf certifications provide the peace of mind required by our government and financial customers. Sheet-by-sheet monitoring and cleaning, progressive numbering and barcoding, single hologram control and full traceability are some of the services we offer our customers.

To complete Sun Chemical's security solutions portfolio, customers also have access to high-tech lamination plates through the joint venture, 4PLATE. 4PLATE's technology includes CLI-MLI, ID-Optic, 3D effects, latent images, braille, micro-text and guilloches, to strengthen brand protection and anti-counterfeit features in government and sensitive documents.

With four global production sites, 4PLATE offers standard and security lamination plates, engraving technologies, security features, technical assistance, plasma coatings and many more technologies to its customers around the world. In addition, lamination pads, carrier plates, cover plates and positioning systems are available as supplemental materials.

DEUTON-M Magnetic Tape and Pre-laid Magnetic Stripes in Sheets or Reels for Financial, Retail and Security Cards

With the continued growth of loyalty and membership programs, brands are making lamination cards that are much more sophisticated in design. Traditionally, card designers extract brand value out of the magnetic stripe area in a plastic card by playing with its color.

Having supplied the financial sector globally with high-quality magnetic tape for over 40 years, DIC offers a wide range of magnetic tape options which are aesthetically attractive, durable and reliable.

Figure 2 *DIC magnetic tapes come in five standard colors and six sparkling colors.*

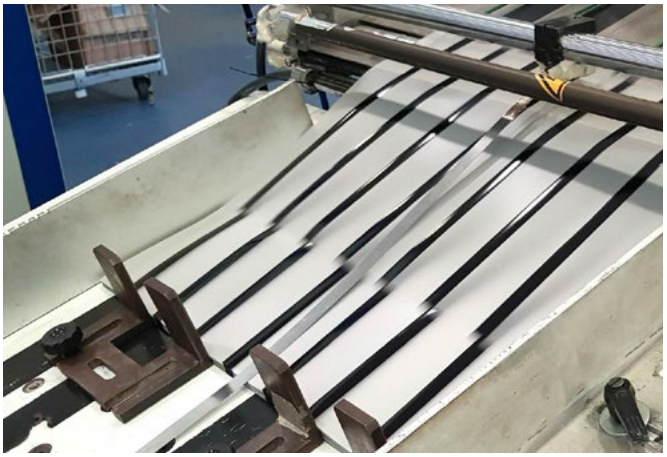

Figure 3 *Sun Chemical's pre-laid magnetic stripes offer convenience and consistency.*

DEUTON-M tapes come in five standard colors (Figure 2) (red, blue, green, gold and silver) plus traditional black and dark brown. Additionally, Sun Chemical, through its parent company DIC, is the worldwide leader in sparkling color and Pantone® matched color magnetic tapes, which are developed as per customer specifications.

Brand protection and security features can also be added to the magnetic tape, including pre-printed information (like logos, URL, etc.), a fluorescent hidden image that can be seen under a black light, or holographic effects over silver or black tape.

As the world's leading ink, resin and pigment manufacturer, DIC has the capability to formulate and produce proprietary coating systems. The company has developed the strongest topcoat layer available for magnetic tape. This surface provides extra protection to not only shield the magnetic surface, but also maintain the vibrancy of the color and printing throughout the life of the card.

Sun Chemical through its subsidiary, C.T.LAY, also offers the DEUTON-M and other magnetic tapes pre-laid (Figure 3) onto a variety of substrates including PVC, polycarbonate or PETG to provide convenience and consistent quality to card manufacturers. Flexible, robust production lines are monitored with camera control systems to ensure that overlays are produced at peak quality and efficiency.

New Ways to Win Real Estate on the Card by Using the Magnetic Stripe as a Design Feature

To help card designers in their quest to reinforce the brand image of their customers, Sun Chemical and its subsidiary, C.T.LAY, offer a variety of ways to use the magnetic stripe area of the card as a design feature, thus winning valuable real estate on the card.

By using wide magnetic stripes, between 14.3 mm and 16 mm, pre-laid onto PVC or PC overlay, card manufacturers can achieve a **"bleed-out" effect** on the magnetic stripe that looks both modern and elegant.

This design fully complies with current card manufacturing specifications, and the card can be encoded with the traditional tracks and read by any standard equipment. Furthermore, this wide magnetic stripe can have any color imaginable.

Another option that offers complete freedom of design is the **hidden magnetic stripe,** which is a magnetic stripe that can be overprinted without losing its function.

Sun Chemical offers overlay sheets that have been pre-laminated with hidden magnetic stripes and primed, ready to be overprinted, then collated for lamination as usual.

Card manufacturers can mimic a wide magnetic stripe, a custom color magnetic stripe, or fully cover the magnetic stripe for a full hidden design. The design possibilities are endless!

A fully proven and tested manufacturing method ensures that the magnetic stripe maintains its recording and reading capabilities, making this option suitable for any kind of plastic card application. Loyalty programs, access control and financial cards will always maintain their performance requirements for both encoding and readability.

By combining DIC, Sun Chemical, C.T.LAY and 4PLATE capabilities, card manufacturers can now produce secure and striking cards with increased efficiency and reduced costs.

Conclusion

Sun Chemical and its parent company, DIC, can provide a complete solution for credit and laminated card production with a full line of inks, coatings, magnetic tapes and adhesives, in addition to color-matching solutions and anti-counterfeiting brand protection products.

Sun Chemical's solutions offer multiple customization options while still maintaining the high level of quality for which Sun Chemical is known. By taking advantage of all the solutions Sun Chemical and DIC can offer together, customers can gain extra value.

To learn more about Sun Chemical's full range of solutions for plastic cards, call 708-236-3798 or visit www.sunchemical.com/plasticcards.

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