

A Complete Solution for Credit and Laminated Card Printing



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 2017, the global card market reached \$18.9 billion with more than 30 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 46% 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 spectrum.ieee.org, credit and debit card fraud resulted in losses of \$16.8 billion in 2017 and 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; it creates the most secure, durable and climate-resistant cards in the industry. Additionally, the ICMA projects a one to two percent growth rate in laminated PVC secure and non-secure cards.

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.

working for you.

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

- strong adhesion of inks and coatings to the PVC core material;
- lamination properties which 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;
- the ability to add brand-protection solutions to the cards; and
- good lithography performance on printed cards with minimal tacking and blanket swelling.

Sun Chemical and its parent company, DIC, can provide a complete solution for credit and laminated card printing 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 and silver/graphite conductive inks for the growing EMV market.

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.

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.

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

Brand Name	Type/Products	Features	Benefits
SunCarte UV Offset	<ul style="list-style-type: none"> • UV-curable offset litho ink system • Four-color process set, blending colors • Special high-density white and dense black 	<ul style="list-style-type: none"> • Optimized resin chemistry • Heat-resistant pigments • Excellent adhesion to a wide range of substrates • Very good litho properties 	<ul style="list-style-type: none"> • Bond strength in excess of ISO standards • Minimal color change after lamination • Robust prints • Optimized press performance
SunCarte UV Plastic Card	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • UV curing • Optimized resin chemistry • Solvent-free/green solution • Long-flowing ink rheology designed for use on cylinder presses 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • UV-curable screen inks, opaque white and clear 	<ul style="list-style-type: none"> • Optimized resin chemistry • Excellent adhesion to polycarbonate • Super-opaque white • Non-yellowing clear 	<ul style="list-style-type: none"> • 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



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 economic 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,



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

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 .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 or PMS color inks to be delivered.

The dispenser is preloaded with the relevant databases to ensure printers can begin mixing colors they need to support their business. To support customers in their color matching, Sun Chemical provides access to the 100,000+ colors in the **Sun Chemical Global Shade Library** (GSL) through its Regional Color Matching Labs (RCML).

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.

Beefing up Plastic Card Security with Brand Protection Solutions from Sun Chemical

ID and credit card fraud have led to the need for increased card security. This has resulted in sophisticated credentials that feature layers of visual, physical and digital security as a way to protect employees, citizens of nations and people's money.

Using its wide array of overt and covert brand-protection technologies, Sun Chemical can help governments and brands with strategy formulation, contingency planning, chain of custody framework and other components to ensure the integrity of ID and credit cards.

One covert approach that Sun Chemical offers is an infrared marker and coding solution called Verigard™ (Figure 2), a security system that adds a small quantity of taggants (or chemical markers) to inks, varnishes or coatings for use in any print process and on any substrate.

Verigard taggants have no impact on print performance or color properties because they are added in extremely low concentrations. This system is useful because cards can be authenticated immediately by using Sun Chemical's proprietary hand held V400 reader. Sun Chemical also offers inline verifiers to ensure that 100 percent of what comes off a printing press will be readable in the field.

The Verigard lock and key system provides a high level of security by ensuring the taggant, reader, ink and substrate are tuned in a manner that allows unique and definitive verification, while maintaining brand guidelines and color consistency requirements.

In addition to the Verigard system, Sun Chemical can also utilize Hidden Image Technologies which are images hidden in existing art work using



Figure 2 Using Sun Chemical's V400 reader and Verigard security system ensures a high level of security for plastic cards.

proprietary software which encodes covert images into graphics. These images are revealed either optically by using a credit card-sized plastic lens, or digitally using a smart phone equipped with a decoding software app. One of the advantages of Hidden Image Technology is customized messaging, where multiple images can be hidden, such as words, logos or pictures.

Implementation is simple, as no special inks or print techniques are required. Hidden Image Technology is also very secure when encoded at high resolution or in a clear varnish or coating.

While overt and semi-overt security elements are easy to recognize they are inherently less secure than covert options like Verigard and Hidden Image Technology. However, they can provide an additional deterrent to help fend off counterfeiters while also helping to provide an assurance of authenticity to consumers.

There are a variety of overt and semi-overt options that can also be used, including: inks that change color with view angle, metachromic inks that change color based on the light source, UVC inks that are the next generation of UV inks and thermochromic inks which change color based on temperature.

By incorporating these types of security measures on ID cards, governments and companies can protect their constituents and/or employees.

In addition, Sun Chemical now offers pre-patched holograms for government documents and ID cards such as passports and driver's licenses. While holograms are traditionally imbedded in polycarbonate, Sun Chemical can apply them to a variety of substrates. Pre-purchased holograms may also be provided and procedures will be tailored to match specific requirements. Sun Chemical utilizes best-in-class quality control

systems, including sheet-by-sheet monitoring and cleaning, progressive numbering and barcoding, single hologram control and full traceability.

Credit card companies are also increasing the security of their cards through EMV® technology. Sun Chemical offers a variety of electronic materials options for this important space, including printed antenna and metallizations for interconnect, as well as advanced materials, such as ink jet and aerosol jet printable nano-silver.

By adding the magnetic strip technology offered by DIC, Sun Chemical's parent company, brand owners can further enhance security through a range of materials that combine conductive inks with magnetic strips.

Through Sun Chemical's Partnership with T+Ink, **T+Sun** was created, allowing **Touch Code** to be introduced into the marketplace. Touch Code is an embedded code that, when connected to a smart device, activates a range of options, including security and web interaction. Touch Code can remove many of the steps to sign up new customers for a credit card or rewards program or register for a gift card, simply through an interaction with the consumer's smart device and a printed medium.

Through Sun Chemical's brand-protection services and electronic materials groups, credit card brands, companies and governments can find security solutions that will best meet their individual needs and requirements.

DEUTON-M Tape Options Offer Strong Characteristics 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. Sometimes they even require different colors and styles of magnetic tapes taking advantage of the magnetic tape space by employing either a special color match or printing. This enlivens this dead space while further enhancing the brand.

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.

DEUTON-M tapes offer high quality and low noise, and come in five standard colors (Figure 3) (red, blue, green, gold and silver) and six sparkling colors that include black in addition to the standard colors. Customized colors can also be developed.

Another option can be to add visual information, such as the corporate name, URL, telephone number, etc. onto the magnetic strip.

Brand protection and security features can also be added to the magnetic tape, including a fluorescent hidden image that can be seen under a black light, or holographic silver and black type. Customized colors to match brand standards can be created per customer specifications.

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 top coat 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.

DEUTON-M tapes come with an overprinting layer to protect the magnetic layer from abrasion by the magnetic head of the card reader. In addition, DEUTON-M tapes release easily from the PET carrier film and are designed to meet the stringent specifications required for the lamination process.

Sun Chemical also offers pre-laid standard and holographic magnetic stripes which are applied on 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. Sun Chemical can provide magnetic stripes, double stripes and signature panels or utilize provided materials. By combining high-quality DEUTON-M tapes with Sun Chemical's graphics effects and overlays, manufacturers can produce secure and striking cards with increased efficiency and reduced costs.



Figure 3 DEUTON-M tapes come in five standard colors and six sparkling colors. They can also add visual information and security features.

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4Plate Solutions for Lamination Plates - Complete Portfolio of Innovative Materials for Lamination Plate Challenges

4Plate is a joint venture organization comprised of lamination plate technologies from Sun Chemical, Prograur and Plascotec. With four global production sites, 4Plate offers standard and specialty plates, engraving technologies, security features, technical assistance, plasma coatings and many more technologies to its customers around the world.

4Plate's core lamination plate business consists of stainless steel, hardened stainless steel and brass varieties with gloss mirror, silk, matte and supermatte surface finishes for beautiful plastic cards. In addition, lamination pads, carrier plates, cover plates and positioning systems are available as supplemental materials.

Innovative security features offered by 4Plate strengthen brand protection through the use of CLI-MLI, IDOPTIC, 3D effects, latent images, braille, micro-text and guilloches which are perfectly in register due to positioning pin systems. 4Plate offers customized security solutions for a range of plastic card applications.

In addition, 4Plate offers wear-resistant DLC and anti-stick coatings for long-life plates. Along with durability, 4Plate provides graphic artwork and technical assistance to further support its innovative lamination plate technologies.

Conclusion

Sun Chemical and its parent company, DIC, can provide a complete solution for credit and laminated card printing 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 and silver/graphite conductive inks for the growing EMV market.

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.