



## TECHNOLOGY GUIDE FOR REWRITABLE CARD PRINTING

### Datacard® SP25 Card Printer



HOW REWRITABLE CARD PRINTING WORKS

INNOVATIVE APPLICATIONS FOR MULTIPLE MARKETS

ADDITIONAL CONSIDERATIONS FOR YOUR PROGRAM

**Datacard**Group

SECURE ID AND CARD PERSONALIZATION SOLUTIONS

# UNDERSTANDING REWRITABLE CARD PRINTING TECHNOLOGY

Rewritable card printing gives card issuers in a variety of markets a unique and affordable way to change the information on a photo ID or other plastic card without issuing a new card. This technology is ideal for applications that involve information that is time-sensitive or changes frequently.

## The basics of rewritable card printing

What makes rewritable card printing possible is a special rewritable card stock that features a clear layer of heat-sensitive material which overlays a conventional PVC or PET substrate. Embedded within the heat-sensitive layer are a unique dye and developer that chemically bond when heated to a specific temperature and rapidly cooled. When the substances bond, the result is a visible dot. In the same way, when the substances are heated to a specific lower temperature and slowly cooled, the chemical bond breaks and the heat-sensitive material becomes clear again.

This temperature-controlled reaction effectively enables the printer to “erase” the card (breaking all the chemical bonds) and then “rewrite” the card (forming new chemical bonds) with new information.

In a rewritable card printer, heat is applied with the same printhead used in conventional full-color card printing. Unlike conventional card printing, however, the printhead comes into direct contact with the card surface. (Normally, a dye sublimation ribbon would be situated in between the printhead and the card.) Direct contact allows the heating elements of the printhead to erase and rewrite each pixel on the card.

The process of erasing and writing a card is referred

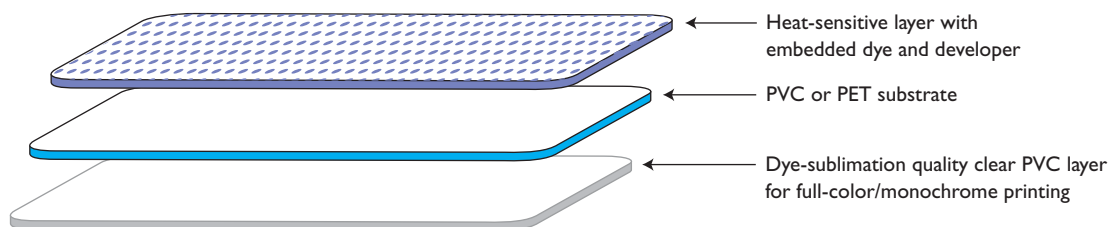
to as one “rewrite cycle.” Typical rewritable cards can withstand at least 500 rewrite cycles before image quality begins to deteriorate. Rewritable card printing is monochromatic. In other words, all the pixels on a rewritable card are the same hue.

Rewritable card printing can achieve image quality as high as 300 dots per inch (dpi), which provides ample resolution to reproduce photos, graphics and text, including fonts as small as six points. Although rewritable card printers can print bar codes, it is not recommended. The contrast will not be as high as with a conventional black-and-white bar code, and scanning a rewritable bar code will be more challenging than normal.

## The anatomy of a rewritable card

Because rewritable cards are essentially conventional plastic cards, they can be personalized with many of the same technologies as other cards, including magnetic stripes. Rewritable cards have three layers (see diagram below). The heat-sensitive layer contains the embedded dye and developer for rewritable printing. The middle layer is a PVC or PET substrate. The third layer, which forms the opposite side of the card, is clear PVC suitable for dye-sublimation printing. In many cases, the dye-sublimation layer features a color photo, while the rewritable side features text.

Rewritable cards should only be handled by the edges, because fingerprints, skin oils and other residue can degrade image quality. To make card handling easier for operators, most rewritable cards typically feature a matte finish that makes it simple to tell which side of the card is rewritable.



In rewritable card printing applications, a printhead applies heat that activates a dye within the card, which creates a visible dot.

# INNOVATIVE APPLICATIONS FOR A WIDE RANGE OF MARKETS

Applications for rewritable cards are numerous and growing quickly as the technology increases in popularity. Overall, card issuers can use this technology to create two kinds of rewritable cards. The first type will be updated frequently with dynamic information that is pertinent to the cardholder, such as a shopper's loyalty points or a student's class schedule. The second type will be a reusable card that is issued to a new cardholder every time it is rewritten, such as temporary visitor IDs or patient IDs in a hospital. Here are a few likely examples of ways rewritable cards can be used to improve the end-user's experience and reduce the need for card reissuance.

## Healthcare

Hospitals and other healthcare providers can issue patient ID cards that feature preprinted permanent information on the PVC side, such as a hospital logo, and rewritable information on the opposite side, such as the patient's demographic data or medical record information.

## Education

K-12 schools, colleges and universities can print a student's photo and demographics on a fully rewritable ID, or print a photo on the PVC side and use the rewritable side to print a class schedule or school events calendar. You can also print a library card with rewritable due dates or issue copy cards that combine a magnetic stripe with a rewritable tally of the user's remaining copies.

## Transportation

Public and private transportation organizations can issue rider cards with rewritable ticketing details or schedules for buses, trains and subways. Airlines can issue frequent flyer cards with rewritable point totals, or boarding passes with flight information.

## Retail

Retailers can print loyalty cards with rewritable point totals or limited-time special offers. Beauty salons and other shops that rely on appointments can issue rewritable appointment cards for clients. Movie and video game rental outlets can issue membership cards with rewritable return-by dates. Restaurants can issue frequent diner cards with point totals.

## Entertainment

Applications include ski lift tickets, rate cards for casinos, lottery tickets, gaming cards, tickets for concerts and sporting events, and membership cards for health clubs.

## Corporate ID

Rewritable cards are ideal for issuing temporary and visitor IDs that include a name and photo, yet can be returned at the end of the visit and easily reused for a different visitor. Paired with other card personalization technologies, rewritable cards can also be used for access control or time and attendance.

## Nonprofit Organizations

Nonprofits and other organizations that would like to issue temporary ID cards are ideal candidates for rewritable card printing. Examples include blood donation sites and charities with volunteer workers.

1. Insert the card



2. The single-feed SP25 card printer fully erases and rewrites the card in 20 seconds.



3. The rewritten card is available for use.

# ADDITIONAL CONSIDERATIONS

## Rewritable cards and security

Rewritable cards are not appropriate for secure photo IDs or other high-security applications, because rewritable information can fade or be erased. Ultimately, issuers should think of rewritable cards in terms of enhancing the end-user's convenience — not the end-user's security.

### Card characteristics

Because the dye embedded within rewritable cards changes in relationship to temperature, ambient temperature can affect the information printed on rewritable cards. Rewritable cards should not be left in a car or other high-temperature environment.

Prolonged exposure to temperatures of 100°F and above will cause the card's print density to decrease and will eventually erase the card. The card can be rewritten, but any existing information is lost.

Ultraviolet (UV) rays may also affect the appearance of rewritable cards. Specifically, dyes can be damaged by prolonged UV exposure, which may permanently "fix" the image on the card and prevent it from being erased.

### Printer adjustments

Printing temperatures may also affect the process of erasing and rewriting the card. This is why the "erasing power" and the "writing power" are user-adjustable in the Datacard® SP25 card printer. Users may need to find the precise balance that works best in their specific environment. If the writing power is too high, the image may become difficult to erase. (This is known as "image ghosting.") Other factors may come into play as well. For example, the quality of the card surface and the number of erase/rewrite cycles already completed can each affect the quality of a newly written image. Over time, print density will fade and cards will no longer be reusable.

### LEARN MORE TODAY

Rewritable card printing holds a great deal of promise for card issuers in a variety of markets. For more details about how to implement an affordable rewritable card printing program, please contact your Datacard Sales representative or visit [www.datacard.com/ID](http://www.datacard.com/ID) for more information.

## DatacardGroup

11111 Bren Road West

Minnetonka, MN 55343-9015

+1 952 933 1223

+1 952 931 0418 FAX

[www.datacard.com](http://www.datacard.com)

Datacard is a registered trademark, trademark and/or service mark of DataCard Corporation in the United States and/or other countries. Names and logos on sample cards are fictitious. Any similarity to actual names, trademarks or tradenames is coincidental.

©2006 DataCard Corporation. All rights reserved. Specifications subject to change without notice.

DP6-9007