



*digital
identification
solutions*

Card Holders

- to protect the card
- to show the card
- optional features to add clips, lanyards, chains etc.
- available in landscape and portrait format
- available in several designs: closed, open, for one or more cards

Clips

- available in several designs
- with durable vinyl or plastic bands
- in many colors
- for attaching the card holder to clothing

Lanyards

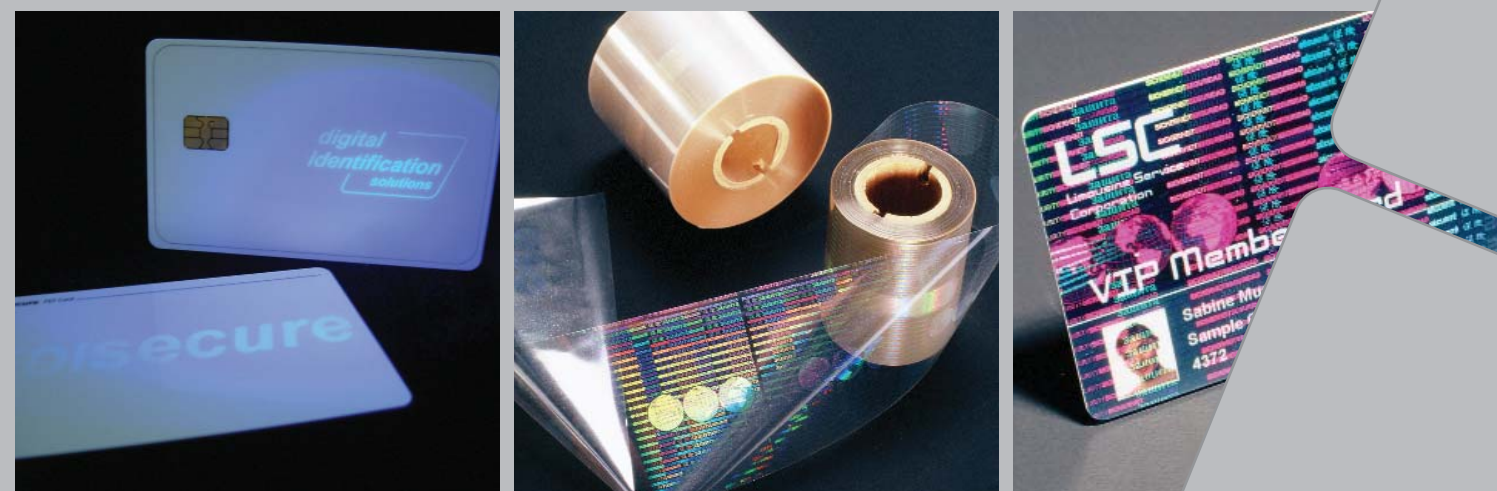
- helps to wear the card holder without having to attach it to clothing
- available in many lengths and widths
- available with different connections: ring, hook, clip and clamp
- available in a wide range of colors
- your logo and/or text can be printed onto it

Retractors

- available in many colors and designs
- available in different lengths
- your logo can be added

Due to the many available variations of these accessories, please contact us for further details.

EDISecure™



Cardware

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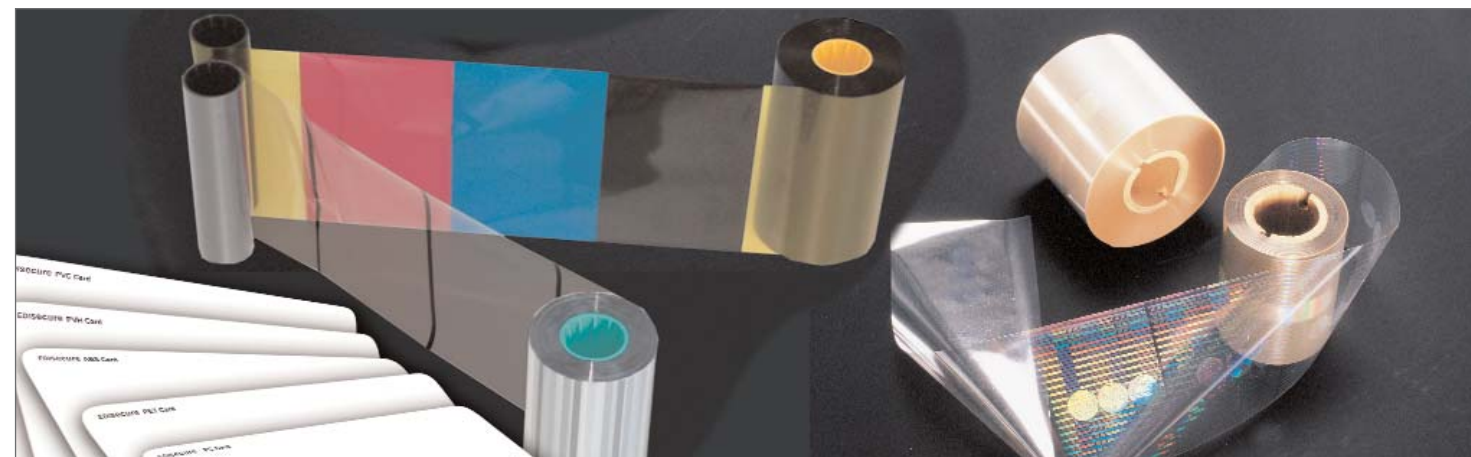
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Cards - a magical piece of plastic

Everybody owns a number of cards. From membership and loyalty cards, bank and credit cards, company IDs and access cards, to drivers licenses and national ID cards, cards are present for every occasion. A piece of plastic, white or colored, which gives access to premises, settles invoices or identifies individuals. As long as the card works and delivers the expected services, no pays any attention to it, but as soon as the card fails, it suddenly gains a great deal of attention.

Before issuing the first card in a new ID project, it is extremely important to consider the card technology itself. The success of a new card project depends greatly on the reliability of the card, and reliability translates into satisfaction for the end user.

The careful selection of the proper card material, an economical yet secure encoding technology, and protection of the card against physical and environmental damage are essential and often underestimated parts of the overall success of an ID project. This brochure provides an overview of the

various card constructions, the variety of encodings and the many available options for increasing card security. For a more thorough discussion regarding your project, please benefit from our expert knowledge by contacting one of our card specialists. Our knowledge is your key to making your card project an impressive success.

Identifying appropriate card material

Selecting the proper card material is very dependant upon how the card will be used and the expected lifetime of the cards. The printer technology used to print the cards also limits or expands the available card material types that can be used for your project. Environmental damage caused during card manufacturing and eventual disposal is a consideration, as well. Lastly, a good balance between card cost and functionality will be a key factor.

Lifetime

The expected card lifetime is a key factor in identifying the card core material. Basically, how often do you plan to reissue or renew a card for the same person? The different core plastic materials offer different physical characteristics and lifetime expectancies. PVC, for example, is reliable for a two-year period, while Polycarbonate can easily last up to ten years. ABS cards are good for a five-year cycle, while PET (true 100% Polyester) is a good choice for up to eight years of use. These are obviously generalizations, as the actual card lifecycle will depend greatly on the treatment and use of the card.

Printing Process

The technology used for the card printing process will dictate the range of card material choices. Direct-to-card printers can only print on PVC surfaces, while re-transfer or reverse image printers can print on PVC, PVH, ABS, PET and even Polycarbonate (PC) card bodies. For further information on printer technologies, refer to the detailed *EDISecure™* XID printer brochure.

Environmental Aspect

Many countries are moving away from PVC-based products to minimize environmental concerns associated with the manufacture and disposal of PVC-based products. Alternative card materials that are not hazardous to the environment include ABS, PET and Polycarbonate.

Cost

In terms of costs, the challenge is to find the best cost-benefit ratio. ABS is a very cost-attractive choice when re-transfer printing will be used to print the cards. PET and Polycarbonate cost more, but are a must when the project requires a long-lasting, robust card. While it is tempting to go with the cheapest card material available, this often turns out to be more expensive in the long run due to the number of damaged or faulty cards that have to be replaced. Premature card failure entails two costs: 1) the cost of the replacement card, and 2) the cost of the labor and time required to issue the replacement card.

Synchronized Product Portfolio

The *EDISecure™* Cardware product portfolio consists of card materials, color ribbons, Re-transfer films and overlamination materials. All of them are synchronized to each other and to the *EDISecure™* hardware program through test procedures performed by internal and external departments and meet all ISO requirements.

In order to insure consistent quality, every supplies shipment is tested by our experienced quality assurance team before delivery.

Card materials

The *EDISecure™* cardware programm consists of the following materials:

- PVC
- ABS
- PET
- PVH
- Polycarbonate

An *EDISecure™* card can be clearly identified by certain quality characteristics which are also important factors for the personalization process:

- no sharp edges
- dust-free cards
- no surface scratches
- flat cards
- polished cards
- tight tolerances on dimensional characteristics
- shrink wrapped to 100 or 500 pcs

Color Ribbons and Re-transfer films

In addition to our Re-transfer Film we offer the following types of color ribbons:

- Monochrome black: only black color fields
- CMYK: Cyan, Magenta, Yellow, Carbon black
- CMYKK: Cyan, Magenta, Yellow, Carbon black, Carbon black
- CMYKUV*: Cyan, Magenta, Yellow, UV layer
- CMYKPO*: Cyan, Magenta, Yellow, Peel-off layer

Color printability and adhesion to the Re-transfer film and card material is constantly tested for permanency. Both the color ribbons and the Re-transfer film are packed in single plastic bags.

* in preparation

Overlamination Materials

The *EDISecure™* program contains the following products:

- Thin OVD Overlay Ribbon
- 0.5 mil Clear Patch Ribbon
- 0.6 mil OVD Patch Ribbon
- 1.0 mil Clear Patch Ribbon

It is possible to produce holographic designs according to artwork provided by the customer. Regarding a significant one-time investment for a customized design a very attractive high-resolution standard design is also offered.

Every production is tested for adhesion, laminating speed, temperature and dimensions.

All *EDISecure™* lamination materials are optional available with chip or magnetic cut-out.



Contactless Encoding Technologies (RFID)

RFID (Radio Frequency Identification) cards store data in a chip that is embedded in the card body. For communication between the embedded chip and a reader, an antenna is also embedded in the plastic card. The advantage of this technology is that the exchange of information does not require any contact between the card and the reader. Storage capacity typically varies between 256 bytes and 4 kilobytes. The most common technologies are LEGIC, MIFARE and HID.

Contact Chip Technologies

Contact chip technology exchanges data, which is stored in a small Integrated Circuit (IC) embedded in the card body, via a field of contacts on one surface of the card. The two most common types of contact chip cards are the memory card and the processor card. The memory card can only store data, with a capacity that varies from 256 bytes to 128 kilobytes. A processor card can store data and even perform computer-type operations.



Magnetic Stripe Technology

This is one of the oldest methods used to store data on a card. Basically, two types of magnetic stripes are used. High-coercivity (HICO) stripes are encoded at 2750 or 4000 Oersteds, and low-coercivity (LOCO) stripes are encoded at 300 Oersteds. The stripes are divided into 3 tracks. Per ISO standard 7811, track one of the stripe can store 76 characters and is designed as read only (not re-writable) after the first encoding. Track two can store 37 numeric characters and is designed as read only. Track 3 can store up to 104 numeric characters and is both readable and rewritable.

Barcode

One-dimensional (1-D) barcodes are well known and widely used, though the storage capacity is very limited. Data is represented via the combination of black bars of various thicknesses and the gaps between the bars. The most common 1-D barcode is Code 39. Larger storage capacities are available with 2-dimensional barcodes such as PDF 417 or Datastrip. For example, it is possible to store a small photo image, a signature or even fingerprint data in a 2-D barcode.

	PVC	PVH	ABS	PET	PC
Advantages	<ul style="list-style-type: none"> economy priced well processable good mechanical strength Direct- and Re-transfer Printing possible 	<ul style="list-style-type: none"> mechanical strength better than PVC due to a blend between PVC and PET layer heat resistance better than PVC (depending on PET share) Direct and Re-transfer Printing possible 	<ul style="list-style-type: none"> very economy priced good heat resistance (80-100°C) best resistance to low temperatures good mechanical strength Re-transfer Printing possible ecological 	<ul style="list-style-type: none"> good heat resistance (90-100°C) very good mechanical strength ecological excellent print results with Re-transfer Printing process 	<ul style="list-style-type: none"> long lifetime, very durable very good heat resistance (up to 160°C) ecological
Keep in mind	<ul style="list-style-type: none"> limited life time low heat resistance (60-90°C) disposal critical 	<ul style="list-style-type: none"> more expensive than PVC disposal critical lifetime as ABS 	<ul style="list-style-type: none"> certain restrictions on pre-printing apply; no pre-printing possible on personalization side Direct Card Printing Process not applicable longer life-time than PVC 	<ul style="list-style-type: none"> slightly more expensive than PVH Direct Print Process not applicable Manufacturing more complex than for PVC (laminating, die-cutting) 	<ul style="list-style-type: none"> more expensive than PET easily breakable when damaged Direct Card Printing not applicable longest life-time
Manufacturing	lamination of layers	lamination of layers	lamination of layers or injection molding	lamination of layers or injection molding	lamination of layers or injection molding
Personalization	Embossing; Printing; Laser-Engraving	Embossing; Printing; Laser-Engraving	Printing	Embossing; Printing; Laser-Engraving	Printing; Laser-Engraving



Preprinted security features

UV Ink

Offset pre-printed logos and/or text that are only visible by exposure to an ultraviolet (UV) light source. The color of the light reflection ranges between yellow, blue and red.



Infrared Pre-print

Provides the same effect as UV ink but is only visible when exposed to an infrared light source. Light reflection occurs in the yellow or red ranges.

Optically Variable Inks (OVI)

OVI uses color-shifting inks that reflect various wavelengths in white light differently depending on your visual angle of the surface.

Microprint

This is preprinted text that is so small it appears to be a solid line to the naked eye. The text can only be read with the aid of a strong magnifying glass. The minimum size of the font is 0.0102" = 0.26 mm.



Iriodin

This is a full or partial card metallic effect using silk-screen print technology. The sparkling effect is generated by metallic pigments in the transparent color.

Iris / Rainbow Print

These are ultra-fine lines or a pattern that change gradually from one color to another. They can only be created at secure printing facilities due to the requirement of special offset printing equipment.

Iridiscent

This is a copy protection color which can be printed over the full card or just portions of it.

Electronically printed security features

Fact to the high quality of Re-transfer Printing the electronically printed security features are an extremely powerful alternative /addition to traditional pre-printing techniques.

Electronic Finline

This can be selected and purchased from a catalog of designs, or it can be custom developed for per client requirements. It is recommended only for large-scale projects.

IPI

Electronically generated Invisible Personal Information (IPI) is an image manipulation feature that can be included in the photograph of a person. The IPI data is only visible by viewing the photograph with a small, inexpensive specialized lens.



Shadow Image

An electronically generated, reduced-density copy of the person's picture is printed as a background behind sensitive text information. This feature makes it difficult to alter the text without destroying the shadow image of the cardholder.



Overlapping Objects

The overlapping of objects like signatures, stamps, pictures, graphics, etc. in the electronic card design can make it more difficult to alter one element of a card without visibly destroying other parts of the card.

Laminated Security features

Thin OVD Overlay Ribbon

This is a thin, transparent foil that includes a two-dimensional generic Optical Variable Device (OVD) (often called a hologram) for high security and edgeless laminating which is less than 0.00004" = 0.001 mm thick.



0.5 mil and 1.0 mil Clear Patch Ribbon

This clear overlay offers very high or extremely high protection of the card surface against physical abrasion. It is available with cutouts for ISO contact chips and magnetic stripes.



0.6 mil OVD Patch Ribbon

This two-dimensional generic OVD offers very high protection of the card surface against physical abrasion. It is also available with cutouts for ISO contact chips and magnetic stripes.

Secure Transportation and Storage

Card security in highly secure ID projects begins very early. When cards are produced with any pre-manufactured security features, it is wise to invest in a protected transportation procedure from the card manufacturing site to the ID production site(s). The same applies for the creation and transportation of custom overlamination materials.

The transportation of the blank specialized card bodies and overlaminates should be arranged under the safest possible conditions. A suitable tracking procedure must be in place to ensure that not even a single card or lamination foil gets lost.

Such security prerequisites are not required when applying electronically personalized security features.