SECURED CARDS

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EVOLIS

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1. INTRODUCTION

For official document such as National ID cards, driving licenses, or to reinforce the security of your business or organization, a simple ID badge is not enough.

In a way to protect your interests and your identity, the setting up of a secured identification can be necessary.

Each secured identity solution is unique and involve a number of question to ask before full implementation, for example:

- Lifespan and card resistance
- Level of security: a simple secured identification with impossible to forge but visible elements or a high secured level with hidden or invisible for human eye elements?
- Conception: protection of the front card only or of the both sides?
- The kind of information to include on cards.

2. THE LAMINATION

What is the lamination

The lamination consists in the reinforcement of the card surface, applying a patch or a film to protect the card from wear and tear and UV rays and to fight forgery.

In general, this action is performed in two steps by the machine: first it prints and then applies a film. The varnish or film is applied at a very high temperature is out of reach of a traditional print heads, and therefore, requires special equipment: a laminator.

Why use the lamination ?

Laminators feature hot rollers that provide temperatures in the 280-375°F (140-190°C) range. With such temperatures, laminators actually “stick” the lamination material onto the plastic card.
This technology can be used when:

- The cards are used frequently in readers for barcodes, magnetic stripes or smart cards.
- More than three years lifespan
- Cards require a high level of security and must be impossible to forge.

Protective layer (lamination film) →

Printed data (picture and text) →

RFID chip →

Example of card with lamination patch:
A patch or a film can have different thicknesses depending of the protection you want for your cards.
If you choose to apply a film instead of a patch, it will cover the whole card's surface.

Type of films

- **Patches:** these are thick films aiming at protecting a card from 3 to 10 years, depending on patch thickness 0.6 mil (15 microns) or 1.0 mil (25 microns). They are recommended for applications requiring high durability and high tamper resistance. The patches do not cover the entire card surface.

- **Varnishes:** the ribbons apply a thin layer (about 4 microns) to the cards, edge-to-edge. They will protect the cards for 2 to 3 years and are recommended for applications requiring a low durability and a minimal tamper resistance. The film, similar to a monochrome ribbon, is continuous and does not require adjustment or positioning.

The Evolis Lamination ribbons are specially designed for:

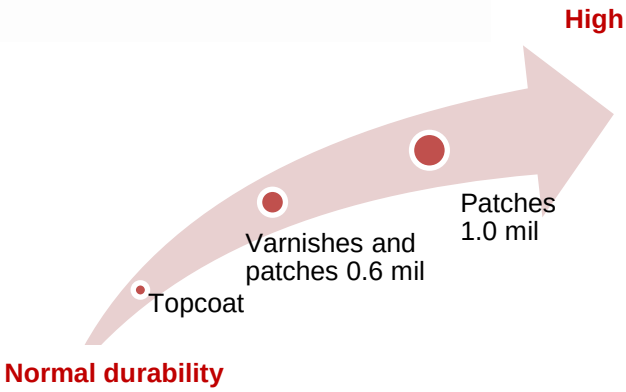
- Extreme durability and protection from water and humidity for identification cards.
- Excellent adhesion to card surfaces
- Excellent clarity

Type of films

Any regular PVC card can be used to apply a varnish since it will be transferred at a quite low temperature. The bending effect will be very smooth. When applying patches it is recommended to use composite cards made with PET and PVC. Depending on the patch thickness (0.6 mil), it is also possible to laminate on regular PVC material with a very limited bending.

To help you in your choice

First of all, you have to take account the lifespan and the card resistance. Is a varnish enough? Do you need a superior card resistance?



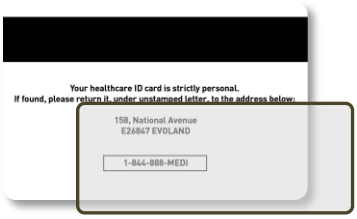
According to the type of material you choose, your cards will be more durable.

Estimated lifespan:

- Topcoat: 2 to 3 years
- Varnishes and patches 0.6 mil thick: until 5 years.
- Patches 1.0 mil: up to 10 years.

These films can be translucent (protection against UV radiation as standard) or with holograms. Our lamination patches can be standard, with identical patches on the ribbon, or alternated (for dual-sided lamination). Multiple design layouts can be combined to match different requirements:

Application on the full surface of the card



Layout for cards that have a magnetic stripe

Layout for contact smart card

3. THE HOLOGRAMS ON CARDS

What is a hologram?

A hologram is a three-dimensional image, created with photographic projection. Unlike 3D or virtual reality on a two-dimensional computer display, a hologram is a truly three-dimensional and free-standing image that does not simulate spatial depth or require a special viewing device.

To reproduce the image of an object, the hologram is illuminated by coherent light, ideally the original reference beam. The hologram produces two sets of diffracted waves; one set forms a virtual image coinciding with the original object position and the other set forms a real image on the other side of the plate. Both are three-dimensional.

A hologram is an optical device which produces an image:

- Which exhibits variable colours (rainbow)
- With variable image content
- Which can be animated
- Which appears as stereoscopic.

Why use a hologram as a security feature?

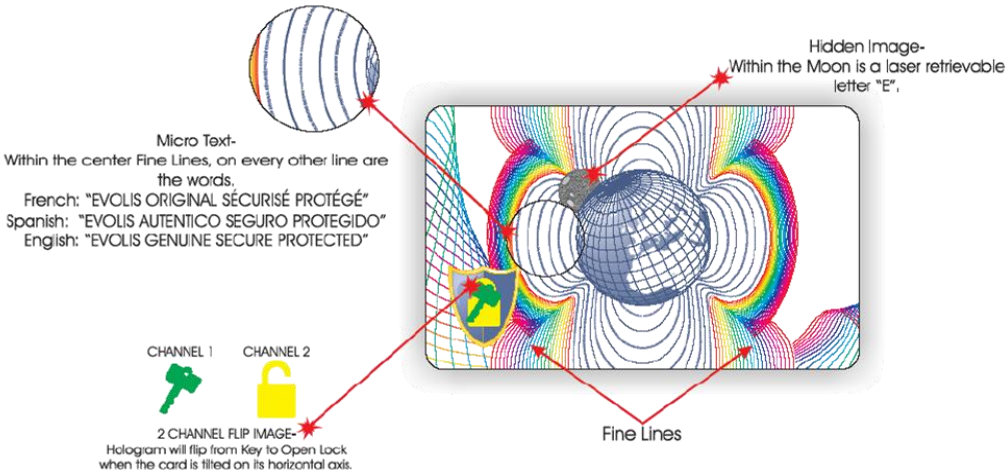
The hologram is a security enforcement tool because it is not possible to duplicate a hologram with a scanner or a color photocopying machine and it is not possible to manufacture or copy a hologram through standard printing processes.
The initial level of visual security can be used to integrate additional levels of control for a card.
Creation and reproduction of holograms are exclusively performed by a small number of industrial companies. The techniques employed are complex and use very rigorous procedures. Holograms, therefore, stand as a dependable solution for printing secured badges and cards.
No material is required to control the genuineness of a hologram. This can quickly and reliably be performed at a glance. A hologram is applied on the card in the form of a transparent layer, thanks to a special ribbon.

The ribbons proposed by EVOLIS are totally transparent ribbons comprising holographic and optical images.
The optical images of the ribbons are shinny, very high definition, 3D animated and with very high resistance against counterfeiting.
Ribbons are used to seal the information contained on the plastic cards. The information is therefore authenticated and protected from falsification or substitution

Holographic Evolis design

There are two ways to apply holograms with Evolis printers. First, you can use a printer equipped with a laminator station, such as Securion. Thank to this printer you could apply varnish films or patches, thicker than an overlay, allowing a better lifespan of your cards.

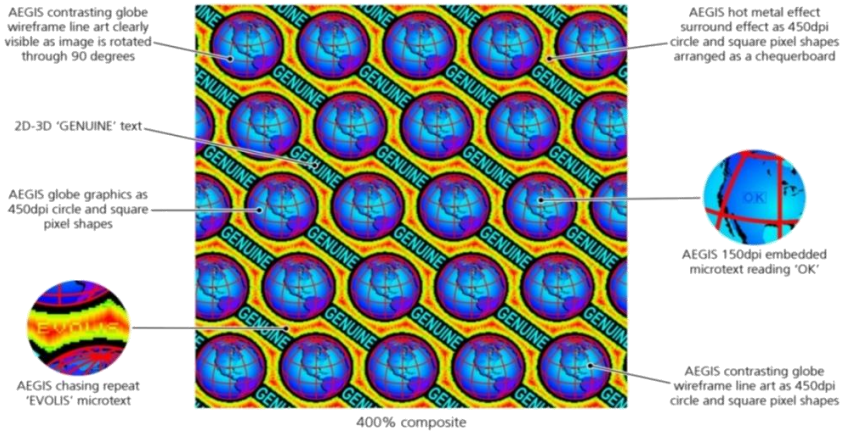
- Hologram for Lamination:



This design is available as patch or as varnish.

The second way to apply a hologram is to use a dye-diffusion thermal transfer. With the Evolis Pebble[4] and Dualys[3], you can apply varnish films with hologram.

- Hologram for Thermal Transfer:



These two card personalization systems provide flexibility and enable to obtain within a few minutes a finished card-in-hand with hologram.

Evolis Custom Hologram Solution

Adding security to your badge may require a custom hologram film. Managed as a special project at Evolis, this film will be designed according to your company requirements.

Customized hologram will help you to reach a significant security level thanks to its unique and registered design. Custom hologram for plastic cards must meet two fundamental requirements:

- Protect the data against falsification
- Protect the data against abrasion and other physical and chemical aggressions

A card protected with a Hologram ribbon will be very resistant. Any attempt of falsification will therefore become very obvious and visible.

- The security levels :

LEVEL 1
When the secured document will be viewed by the public

This hologram has features that are visible and discernible to the average person who has no training or instruction. The images, lines or text are immediately obvious to the viewer.
Supports OVERT features

LEVEL 2
When the secured document will be subject to inspection

This hologram includes features that are not immediately discernible to the average person. These elements are only discernible when an examiner utilizes an additional tool and possesses some level of training. The tools used to expose the feature are simple items such as a magnifying glass, flashlight, or laser pen.
Supports OVERT – COVERT features

LEVEL 3
When the secured document is subject to forensic examination

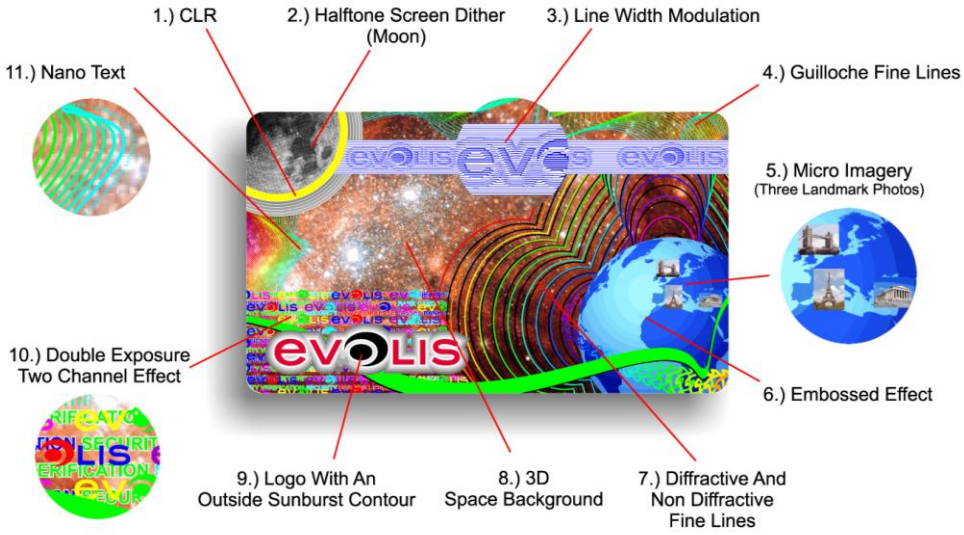
This hologram includes features that are visible or discernible only with complex laboratory equipment. Persons investigating these features require more extensive training.
Supports OVERT – COVERT – FORENSIC features

LEVEL 4
When the risk of counterfeiting is extreme

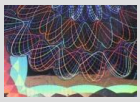
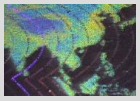
This hologram includes features that are technically unique and often have only one source of production. These sources produce a variety of unique optical technologies that do not rely solely on the holographic process.
Supports OVERT – COVERT – FORENSIC – UNIQUE features

- The security features:

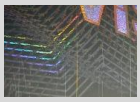
Example of a personalized secure card:



Explanation of the features used:

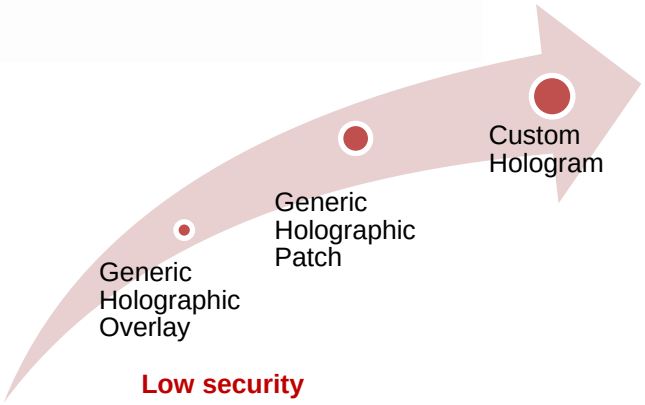
	**1. Single Axis CLR (Covert Laser Retrievable)** – Images or characters that are undecipherable to the human eye. They are decoded by illuminating the coded area with a laser device and looking for the refracted light projected back at a specific angle. (Level 2 – Covert)		**7. Rainbow Coloring –** Images, lines or characters that refract light using the full color spectrum. The color changes as viewing angle changes. (Level 1 - Overt)
	**2. Halftone Dither Effect -** Propriety banknote software is used to create unique effects which cannot be created with standard laser origination methods. Same software used for item 3 Line Width Modulation. (Level 2 – Overt/Covert)		**8. 2D3D or Multiple Plane Effect –** Images, lines or characters that are composed of elements on the surface plane, above the surface plane or in the background. Elements above the surface plane or in the background exhibit a sense of depth and parallax. (Level 1 - Overt)
 	**3. Line Width Modulation (LWM) –** Various image and text effects that can be created by the mathematical manipulation of width, length and height of lines. (Level 3 – Overt/ Forensic / Level 4 - Unique)	 	**9. Animated Geometrical Shapes Morph-** Geometric shapes that morph color as they are rotated. (Level 1 - Overt)
	**4. Guilloche Patterns –** A series of high resolution lines, curves and rosettes or any combination of these elements. These designs are generated by using very sophisticated software. Each element can be assigned a predetermined color shift to create an illusion of synchronized animation. (Level 1 - Overt)	 	**10. Multiple Channel (Switch) Effect –** Two or more distinct images that occupy the same area of the hologram. These images shift from one to the other when viewed from different angles. (Level 1 - Overt)
	**5. Micro Imagery –** True color images or photographs that are reduced in size to as little as three square millimeters. (Level 3 - Forensic)		**11. Nano Text -** Diffractive or non Diffractive text that ranges in size from 175 to 40 microns. The text can be clearly seen only through a microscope. (Level 3 - Forensic)
	**6. Embossed Effect –** Optical illusion of relief created by a highly diffractive surface oriented grating that can be applied to images, text or lines in a hologram. (Level 1 - Overt)		

The following board shows you the other security features proposed by Evolis.

	**Gray Scale Coloring** – Images, lines or characters that have no color refraction, but are composed of black, white or neutral variations of gray. (Level 1 - Overt)		**Dual Axis CLR** (Covert Laser Retrievable) – Images or characters that are undecipherable to the human eye. They are decoded by illuminating the coded area with a laser device and looking at the refracted light projected back at a specific angle. Dual Axis CLRs have more than one set of images or characters that are viewed at ninety degree angles from each other. (Level 2 – Covert)
	**True Coloring** – Images that refract their true colors only when viewed at a very specific angle. (Level 1 - Overt)		**Micro Text** – Is diffractive or non diffractive text, whose size can be as small as 175 microns. And can be clearly viewed only with an eye loop or a magnifying glass. (Level 2 - Covert)
	**Stereogram** – An optical illusion of depth and movement created from one or more flat, two-dimensional images. (Level 1 - Overt)		**Font Specific Text**- Lines made from random fonts or words that look like ordinary lines until magnified to reveal the true object. (Level 2 - Covert)
	**Wireframe Text**- Outline of words and objects that can be combined with other effects to make a more complex image. (Level 1 – Overt)		**Holographic Watermark** – A translucent relief of an image or text that causes some part of the image or test to appear convex. (Level 2 - Covert)
	**Latent Effect** – Images, lines or characters that are designed to refract light at a very severe angle. The hologram has to be rotated ninety degrees in order to see the feature. (Level 2 - Covert)		**Hybrid Micro Optical Structures** – The intentional manipulation of the optical structures that compose the hologram in a predefined, undisclosed area to create a unique fingerprint. (Level 3 – Forensic)
	**Combined Effects** – In some instances two or more effect can be combined on the same area or feature of a hologram in order to create a unique hard to duplicate heterogeneous effect. For example, LWM and Micro Text can be combined to create a very unique feature. (Level 1 to Level 3)		**Floating Image:** A unique covert feature whereby a pair of images are projected and appear to float above the surface of the hologram when illuminated with a standard flash light. Available in 2012. (Level 3 – Forensic/Level 4- Unique)

All these features can be applied on all types of films proposed by Evolis (varnishes or patches).
For further information on this specific product, please refer to the "Evolis Custom Hologram guide"

To help you in your choice



According to the type of material you choose, your cards will be more durable and secured.

Estimated lifespan and security level:

- Generic Holographic Overlay: Intermediate security level.
- Generic Holographic Patch: High security level.
- Custom Hologram: Maximum security level.

Evolis proposes a large range of solutions to provide you different levels of durability and security for your printing.