CUSTOM HOLOGRAM RIBBON GUIDE
V 3.1 – SEP 2011
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1. INTRODUCTION

National ID Cards, driving licences and other official documents require very high security standards. In those cases, it is important to add security to the cards to fight forgeries and wear.

The purpose of this document is to help our customers to better understand the Hologram Industry and to help them to develop and launch a hologram ribbon solution with the Evolis Card Printers.

Each hologram ribbon solution is unique and involves a number of decisions to be taken before full implementation. That is the reason why you will find hereafter information about the hologram itself, the elements that a hologram can contain, the Evolis ribbon offer and some indications to have a design adapted to your needs.

2. THE HOLOGRAM INDUSTRY

A bit of history

Holography dates back to 1947, when British/Hungarian scientist Dennis Gabor developed the theory of holography while he was working on improving the resolution of an electron microscope. Dennis Gabor coined the term hologram from the Greek words "holos", meaning "whole", and "gramma", meaning "message".

The development of laser technology in 1960 made of holography a reality.

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

National ID cards, driving licenses and other official documents require very high security standards to fight forgeries and wear. Plastic cards are therefore the ideal solution for any official document that comes with a credit card size.

**Why use a hologram as a security feature?**

- A hologram is impossible to duplicate with a scanner or a colour copier.
- It is not possible to imitate with standard printing technologies.
- The initial levels of visual security can be used to integrate additional levels of control for a card.
- The optical images of the ribbons are shiny, 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.

**What is a security hologram?**

A combination of:

- A holographic image
- A carrier to support the image and manufacturing process (hot stamping foil, laminate, self-adhesive label...)
- A device produced in a secure environment and under strict security procedures.

**The targeted markets**

- **Protection of fiduciary documents**: Banknotes, checks, credit cards, tickets...
- **Protection of identity documents**: Passports, identity cards, visas, driving licenses, event badges
- **Authentication of brand products**: Luxury goods, industrial spare parts, sportswear...
3. THE EVOLIS CUSTOM HOLOGRAM

Adding security to your badge can require designing a custom hologram film. Managed as a special project at Evolis, this film will be designed according to your company requirements. This is the guarantee that it will not be sold by anyone else.

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.

To create your own Custom Hologram, you have to consider several elements such as the type of ribbon, the level of security and features.

To help you in your choices, this is a description of the Evolis offer:

4. HOW TO MAKE YOUR CHOICE?

First of all, you have to choose the type of ribbon suiting to your needs. According to that, Evolis proposes to include your Hologram on a ribbon or on a patch:

- Varnish ribbon (continuous): This ribbon is recommended for applications requiring a low durability (up to 2 years lifespan) and a minimal temper resistance. This ribbon is continuous which applies a thin layer (about 4 microns) to the card, edge-to-edge.
- Laminate Ribbon (patch): Recommended for applications requiring a medium to high durability (from 3 to 7 year lifespan) and high tamper resistance. This ribbon is made of patches and is available in 0.6mil (15 microns) and 1.0mil (25 microns) thick. The patches do not cover the entire card surface.

Abrasiveness measure for each type of films:

<table>
<thead>
<tr>
<th>Product</th>
<th>Taber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varnish Overlay</td>
<td>800-1000 cycles</td>
</tr>
<tr>
<td>0.6mil Patch</td>
<td>1500-2000 cycles</td>
</tr>
<tr>
<td>1.0mil Patch</td>
<td>3000 cycles</td>
</tr>
</tbody>
</table>

(Taber cycle is a quantitative measure to represent the abrasion resistance of the thin films.)

Once you have chosen the type of ribbon, you have to take consider the security level that you need:

**LEVEL 1**
When the secured card 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 card 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 card 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

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- The security features:

Example of a personalized secure card:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Single Axis CLR (Covert Laser Retrieveable)</td>
<td>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)</td>
</tr>
<tr>
<td>2. Halftone Dither Effect</td>
<td>Proprietary 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)</td>
</tr>
<tr>
<td>3. Line Width Modulation (LWM)</td>
<td>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)</td>
</tr>
<tr>
<td>4. Guilloche Patterns</td>
<td>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)</td>
</tr>
<tr>
<td>5. Micro Imagery</td>
<td>True color images or photographs that are reduced in size to as little as three square millimeters. (Level 3 - Forensic)</td>
</tr>
<tr>
<td>6. Embossed Effect</td>
<td>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)</td>
</tr>
</tbody>
</table>
The following board shows other security features proposed by Evolis

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7. Rainbow Coloring</strong></td>
<td>Images, lines or characters that refract light using the full color spectrum. The color changes as viewing angle changes. (Level 1 - Overt)</td>
<td></td>
</tr>
<tr>
<td><strong>8. 2D3D or Multiple Plane Effect</strong></td>
<td>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)</td>
<td></td>
</tr>
<tr>
<td><strong>9. Animated Geometrical Shapes Morph-</strong></td>
<td>Geometric shapes that morph color as they are rotated. (Level 1 - Overt)</td>
<td></td>
</tr>
<tr>
<td><strong>10. Multiple Channel (Switch) Effect</strong></td>
<td>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)</td>
<td></td>
</tr>
<tr>
<td><strong>11. Nano Text</strong></td>
<td>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).</td>
<td></td>
</tr>
</tbody>
</table>

**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)
5. ORDERING PROCESS

Ordering your custom hologram:

- Decide the type of image you want to use as custom hologram.
- Decide the type of material you wish to order: Varnish Overlay Ribbon (continuous) or Laminate Ribbon (patches) and the type of cut you need (patches for an application on the full surface of the card or patches with cuts for smart or magnetic stripe for example).
- Decide the security level you want to apply and which type of features.
- Design artwork and submit it along with attached order form. (Set-up fee depends on the features and security level required.)

Artwork approval process:

- Evolis will review artwork, confirm setup fee, provide customer with an artwork proof of custom image. This proof will only show accurate size of images and dimensions and card layout. It shows the graphical elements but the effects will not be available at this stage.
- Reseller will obtain end-users approval and return signed artwork proof of Evolis.
- Reseller to send back signed proof to Evolis for process to continue.

Production of Materials

- Set-up fee of hologram image. Production of your material will begin upon receipt of approved artwork.
Timeframe

The complete process to get custom holograms takes about 10 weeks, assuming that approvals occur according to schedule. Evolis will up to date you on expected ship date when artwork is agreed upon.

- Creation of laser master with hologram and design proposal for approval: 3 weeks.
- After approval of design, creation of shim: about 3 weeks.
- Evolis Quality control and transport time: about 1 week.
- Recombination and production of order: about 3 weeks.
EVOLIS CUSTOM HOLOGRAM ORDER FORM

Please fill-in the following form. This will help us to come back to you with information such as minimum quantity order, setup fee cost, price per roll and accurate lead time.

PROJECT ID (EVOLIS INTERNAL)

Project ID: ___________________________  Product P/N: ___________________________

Short description:
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Volume of cards: ___________________________

Submission date: ___________________________  From: ___________________________

END USER INFORMATION

Company Name:
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Company Address:
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Contact Person:
__________________________________________________________________________
__________________________________________________________________________

Email: ________________________________________________________________

Phone*: __________________________________ Fax*: ___________________________
(incl. country and local codes) (incl. country and local codes)

EVOLIS PARTNER DETAILS

Company name: ____________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

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Company address:

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Contact Person:

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Email: ____________________________________________________________

Phone*: ___________________________ Fax*: ___________________________
(incl. country and local codes) (incl. country and local codes)

SHIPING ADDRESS (IF DIFFERENT FROM THE EVOLIS PARTNER’S ONE)

Company name:

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Company Address:

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Contact Person:

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Email: ____________________________________________________________

Phone*: ___________________________ Fax*: ___________________________
(incl. country and local codes) (incl. country and local codes)

LAMINATE TYPE

☐ Patch

☐ Continuous Overlay Varnish

Thickness:  ☐ 1.0MIL    ☐ 0.6MIL

☐ No Registered Image

Layout (Multiple design layouts can be combined to match different requirements):

☐ Full card.

☐ Layout for cards that have a magnetic stripe.

☐ Registered Image

☐ Layout for contact smart card.

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**Hologram Type**
For Patch and Registered Overlay Varnish:

- [ ] Front side only
- [ ] Back side only
- [ ] Different images for Front & Back*

*In that case, make sure you clearly identify the files you do attach to the description form

**Security Level and Features**

**Overt Features (Level 1):**
- [ ] Rainbow Coloring
- [ ] Grayscale Colouring
- [ ] True Coloring
- [ ] Multiple Channel (Switch) Effect
- [ ] 2D3D or Multiple Plane Effect
- [ ] Stereogram
- [ ] Guilloche Patterns
- [ ] Wireframe Text
- [ ] Embossed Effect
- [ ] Animated Geometrical Shapes

**Covert Features (Level 2):**
- [ ] Single Axis CLR
- [ ] Dual Axis CLR
- [ ] Micro Text
- [ ] Font Specific Text
- [ ] Holographic Watermark
- [ ] Latent Effect

**Forensic Features (Level 3):**
- [ ] Nano-Text
- [ ] Micro-Imagery
- [ ] Hybrid Micro-Optical Structures
- [ ] Combined Effects

**Unique Features (Level 4):**
- [ ] Floating Image (Available in 2012)
- [ ] Line Width Modulation

**Laminate Film Layout**

Based on the drawing below, please select the picture orientation you need for your hologram ribbon.

- [ ] Landscape orientation
- [ ] Portrait orientation

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IMAGE POSITION ON THE CARD

Please indicate the image’s position on the CR80 card. The card has a patch format (reduced sized compared to CR80 cards). Please also indicate whether you to position this hologram on the Front and/or Back side. If you wish specific positioning dimensions, thank you to indicate them.

Top (Landscape)

☐ Front side
☐ Landscape orientation
☐ Portrait Orientation

☐ Back side
☐ Landscape orientation
☐ Portrait orientation

ARTWORK REQUIREMENT

If you wish to proceed with an order, please note the following:

▪ Features with text(s) require a text file to be attached to this description form.
▪ To create a design proof for a hologram thank you to provide native vector files such as Adobe Illustrator, Corel Draw or EPS (Encapsulated Post Script). Some non-vector file format files are acceptable, such as high quality TIF files, but these are always subject to review before acceptance.
▪ To create a design proof for a stereogram very specific files types are required and this must be discussed at length before the design work begins. Please note that design proofs containing stereograms can take longer to produce and finalize than other artwork files.