CUSTOM HOLOGRAM RIBBON GUIDE

TABLE OF CONTENTS

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 and durability to the cards to prevent forgeries.

Why use a hologram to protect your document?
- Eye-catching , colorful and visually appealing
- Difficult to accurately replicate
- Variety of security options to meet demands of each application

You will find hereafter information about the Evolis ribbon offer, the elements that a hologram can contain, and some indications to design a custom hologram adapted to your needs.

2. THE EVOLIS CUSTOM HOLOGRAM

There are two ways to apply holograms with Evolis printers:
- **Using a printer equipped with a laminator station** to apply varnish films or patches (with or without hologram) > Primacy Lamination / Avansia Lamination
- **Using a dye-diffusion thermal transfer printer** to apply a varnish film > Primacy / Zenius

Hologram for plastic cards must meet two fundamental requirements:
- Protect the data against abrasion and other physical and chemical aggressions (type of ribbon)
- Protect the data against falsification (security features)

A card protected with a hologram film will be very resistant. Any attempt of falsification will therefore become very obvious and visible. The durability will depend on the type of ribbon you choose.

Adding security to your badge can require designing a custom hologram film. In addition to the standard holographic films, Evolis can create totally personalized holograms to take card security to a higher level. Hologram customization is carried out as part of a made-to order request, in line with your design specifications. The film is created exclusively for your organization and cannot be used by anyone else.

THE HOLOGRAM IMAGE REGISTER (HIR)

The Hologram Image Register (HIR) is a secure registry of holographic images, established by the IHMA (International Hologram Manufacturers Association) to safeguard hologram copyright. As a member of IHMA, our laminate supplier is able to ask for the registration of any new designs created, if required. In that case a research is conducted in the HIR to help to prevent the accidental copying of an image already registered. If the proposed design is found to be similar to an existing design, the production lead time may be longer and extra elements may be required to the customer to prove authenticity of request.

3. HOW TO MAKE YOUR CHOICE?

THE TYPE OF RIBBON

- **Varnish ribbon:** A thin layer is applied to the entire surface of the card (edge-to-edge). It is recommended for applications requiring a low durability and a minimal temper resistance.

  With a varnish ribbon the hologram can be continuous or registered. A registered image can be described as a discreet (separate) picture and is applied in exactly the same position on each card. A continuous image is a wallpaper pattern.


Registered hologram:

Card   Card

Continuous hologram:

Card   Card
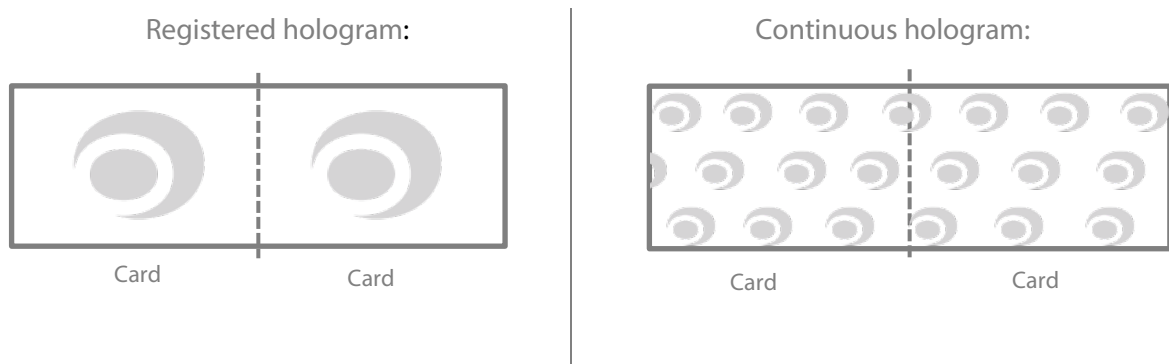
- **Laminate Ribbon (patch)**: This ribbon is made of patches and is available in 0.6mil and 1.0mil thickness. It is recommended for applications requiring a medium to high durability and high tamper resistance. The patches do not cover the entire card surface (near-to-edge).

  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:

Patch on the full surface of the card (near to edge)
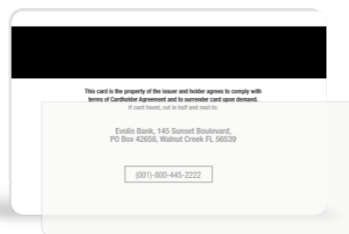
Layout for cards with a magnetic stripe

Layout for contact smart cards

Both types of film can be clear or can incorporate a hologram (personalized or not) to provide an additional layer of security.

TYPE OF RIBBON COMPARATIVE CHART

The type of ribbon choice depends on the card itself and the level of durability expected.

RIBBON	THICKNESS	TABOR CYCLE*	DURABILITY *(Up to)*	CARD COVERING	CARD TYPE**			HOLOGRAM	PRINTER	COST/ print***
					mag	*smart contact*	*RFID*			
VARNISH	3 microns	140	2/3 years	Edge-to-edge	No	No	Yes	Continuous	Primacy Lamination / Avansia Lamination / Primacy / Zenius	* * **
								Registered	Primacy Lamination / Avansia Lamination	**
PATCH 0.5/0.6 mil	15 microns	1,500 – 2,000	3/5 years	Near-to-edge	Yes	Yes	Yes	Registered	Primacy Lamination / Avansia Lamination	***
PATCH 1.0 mil	25 microns	≥ 5,000	5/10 years	Near-to-edge	Yes	Yes	Yes	Registered	Primacy Lamination / Avansia Lamination	****

* Taber cycle is a quantitative measure to represent the abrasion resistance of films.

** Varnish and Patch are compatible with PVC, composite PVC, PET and PC.

*** Cost per print based on the clear ribbon cost (without hologram) only

THE LEVEL OF SECURITY AND FEATURES

Once you have chosen the type of ribbon, you have to take the security level into consideration, depending on your needs:

- Required level of security > What type of threats the security features must protect against?
- Available equipment > How the document will be inspected and authenticated?

Other factors to consider:

- Available budget
- Underlying card design (space, layout)
- Available artwork (logos, text, etc.)

HOLOGRAM FEATURES CATEGORIES

The hologram features are classified by the way you can authenticate them.

| FEATURES CAT.	AUTHENTICATION	DETAILS
OVERT	Naked eye	Easily seen by naked eye (image, lines, text) > 1st check: easy and fast to authenticate, no equipment nor training required
COVERT	Simple tools	Invisible to the naked eye > require the use of a simple tool to be verified (magnifying glass, flashlight, UV light, IR light, or laser pen)
FORENSIC	Complex laboratory tools	Discernible only with complex laboratory equipment > require a high level of skill and expertise to authenticate
MULTI-LEVEL	Complex laboratory tools	Individual features that operate at 2 or more technical levels (eg. exhibit both Overt & Forensic characteristics) to create unique and highly secure authentication devices.

HOLOGRAM SECURITY LEVEL

The security level of your design does not affect the price of the holographic ribbons – it only affects the (one-off) price of the origination. The security level of the overall design (affecting origination price level) is defined as the highest security level from which any single feature is selected.

ORIGINATION PRICE CATEGORY	FEATURES	FEATURES CAT.
TIER 1	2D/3D Multi-Plane Effect, Fine Line Guilloche Patterns, Matte Finish, Rainbow Coloring, Wireframing, High Resolution Lines with Kinetic Effect, Morphing Geometric Shapes	OVERT
TIER 2	Achrogram, 2 or 3-channel (Switch) Effect, 90° Viewable Element, Embossed effect, Latent effect, True coloring	OVERT
	Single Axis CLR(Covert Laser Retrievable), Dual Axis CLR, Micro Text,	COVERT
TIER 3	Micro Imagery,	COVERT
	Brick Matrix Manipulation, Nano Text	FORENSIC
	Line width Modulation (LWM)	MULTI-LEVEL
TIER 4	Letter Lens Effect, 3D Stereogram, 90° Switch Effect	OVERT
	Animated CLR	COVERT
	Nano Imagery	FORENSIC

A few recommendations for your hologram:

- Features must be easy to find and authenticate (quick check < 10 sec)
- Mix different types of features in your design (bright and shiny, difficult to replicate, overt, covert)
- Focus on Level 1/Overt features (suspicions must be raised at the first check or extra controls will not be conducted)
- To make your hologram last longer you can reveal covert features gradually

Example of a personalized secure card:
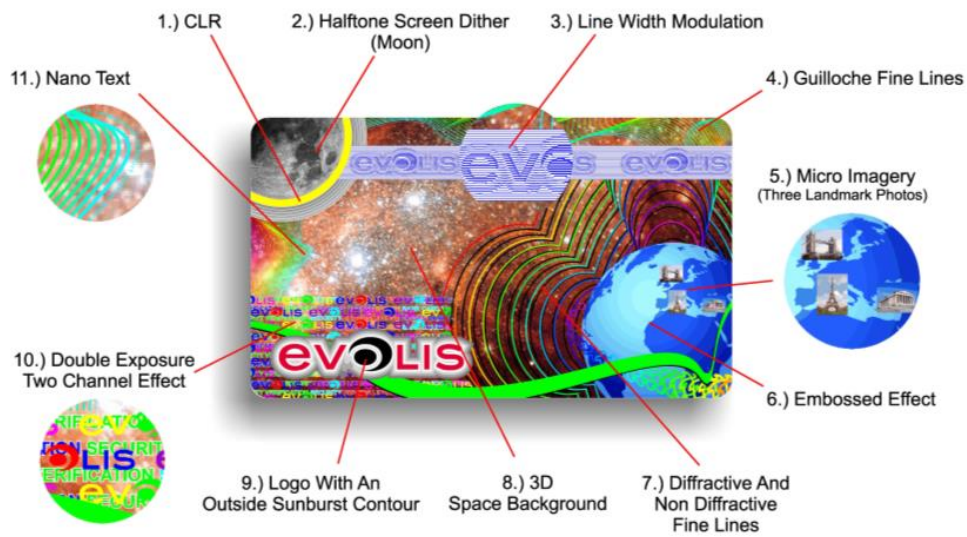
You can find pictures and explanations of the available security features Appendix 1

4. ORDERING PROCESS

ORDERING YOUR CUSTOM HOLOGRAM

- Fill in the Evolis custom hologram order form with the following information
    - o Ribbon type (varnish, patch, with or without layout)
    - o Hologram type
    - o The level of security (features)
    - o The type of image you want to use as custom hologram.
- Design artwork and submit it along with the order form.

ARTWORK APPROVAL PROCESS

- Evolis will review artwork, confirm origination fees (depending on the security level required) and 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.
- A shadow box can be requested for approval with extra fee and process lead time.
- 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

- Origination fees payment. Production of your material will begin upon receipt of approved artwork.

TIMEFRAME

- The complete process to get custom holograms takes about 10-12 weeks, assuming that approvals occur according to schedule. Evolis will up to date you on the expected shipping date once the artwork is agreed.
- Repeat orders: about 10 weeks
- Recombination (moving an existing hologram design from a legacy printer model): about 10 weeks

APPENDIX 1: SECURITY FEATURES

OVERT FEATURES

2 or 3-Channel (Switch) Effect – *Tier 2*
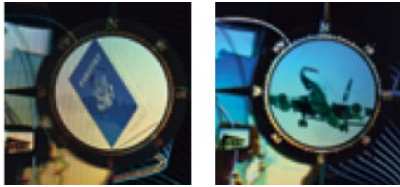
Two or more distinct images can occupy the same area of a hologram. The images change from one to another upon movement of the hologram.
> As all channels occupy the same space in the design, this requires two (for 2 channel) or three (for 3 channel) different graphical elements of the same size. Not recommended for text.

2D/3D Multi-Plane Effect – *Tier 1*

2D/3D multi-plane images, lines, and text are composed of elements that exist on different planes (surface plane, above the surface plane, and below the surface plane), exhibiting a sense of depth and parallax (the apparent displacement of an observed object due to a change in the position of the observer).
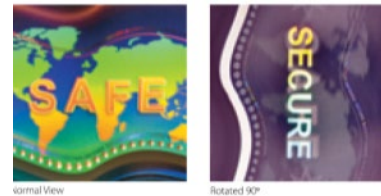*> Any graphical element may be used for this feature.*

Embossed effect – *Tier 2*
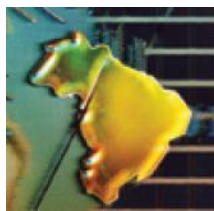
Optical illusion of relief or embossing created by a highly diffractive, surface-oriented grating that can be applied to images, text or lines in a hologram.
> Any graphical element can be used for this feature. Difficult to replicate.
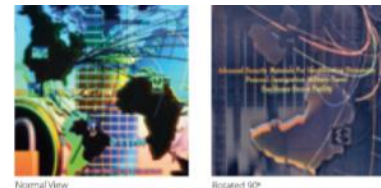
90° Switch Effect – *Tier 4*

The images change from one to another when the hologram is turned through 90 degrees.
> Need at least 2 designs. Images for switch effects should not exceed 1,000dpi resolution. The area used for the switch effect should not include microtext and images used should be simple and easily-recognized.

90° Viewable Element – *Tier 2*

This text and/or imagery is faintly viewable at a normal position and clearly viewable when viewed at a 90° angle.
> For this feature text or simple logo outline are preferred. Should be limited to one diffractive angle. Not so easy to control as the view angle must be precise.

Achrogram – *Tier 2*

A design that switches black areas to become white, and vice versa, when viewed at a 90° angle.
> A single graphic element that is black and white is required for this feature, for example, a simple logo or text. Very easy to verify but not easy to simulate or replicate with printing techniques.

3D Stereogram – *Tier 4*

An optical illusion of depth and movement created from one or more flat, two-dimensional images or three-dimensional models.

> At least 50 frames of an object should be taken in order to create an effective Stereogram. These images should be high resolution files such as .jpeg, .png, or .bmp files. A separate document with specific guidelines for this feature is available.
Difficult to replicate.

Latent Effect – *Tier 2*

Images, lines or characters that are designed to refract light at a very acute angle.

> For this feature text or simple logo outline are preferred. Should be limited to one diffractive angle.
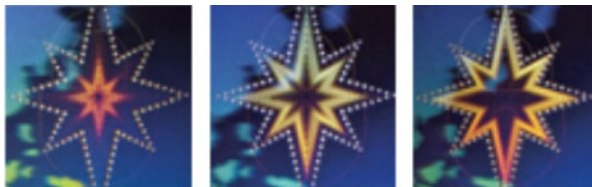
Fine Line Guilloche Patterns – *Tier 1*

Comprise a series of high resolution lines, curves, rosettes, or a combination of these elements generated by highly sophisticated software. Each element can be assigned a predetermined color shift, creating the illusion of synchronous animation.

> Customers can provide a guilloche pattern (lines no smaller than 0.25pt.) or our supplier's design team can create a custom guilloche design for the image. Attractive feature. Not possible with a random continuous varnish.

Letter Lens Effect – *Tier 4*

Crated to resemble characters viewed under a magnifying lens, these letters appear and move when viewed under a point light source.

> A minimum recommended size for the lens is 3mm. Floating symbols should be simple and easy recognizable, i.e. Latin letters, digits, etc. The shape of the Letter Lens can be round and other shapes are possible too (oval, square, etc.).

High Resolution Lines with Kinetic Effect – *Tier 1*

Fines lines that light up sequentially when viewed at different angles, generating the appearance of movement.

> Lines must be individual vector lines. They cannot be collapsed or expanded into one object or path. Lines can be no smaller than 0.25pt. Attractive feature.

Matte Finish – *Tier 1*

Semi-opaque, non-diffractive matte finish in contrast with the surrounding colorful holography.

> Graphical element must be a single color (ie: Text). Easy to identify and authenticate.

True Coloring – *Tier 2*

Images refract their true colors only when viewed at a very specific angle.

> Preferably a high resolution image. Works best with real life images (i.e: flowers, locations, flags).

Rainbow Coloring – *Tier 1*

Images, lines or characters that refract light using the full color spectrum. The color changes as viewing angle changes.

> This feature can be applied to most elements. Generally Rainbow Coloring means Holographic Effect.

Wireframing – *Tier 1*

Outlined words and objects (created with specific software) that can be combined with other effects to create more complex images.

> Outline no smaller than 0.25pt. Used on text only.

Morphing Geometric Shapes – *Tier 1*

Geometric shapes that morph color as they are rotated.

> Geometric morph can be created in any illustration software. For best results the two shapes should have the same amount of points. For example, a 5-point star into a pentagon (5 points).

COVERT FEATURES

Single Axis CLR (Covert Laser Retrievable) –
Tier 2

Images or characters that are invisible to the human eye, they can be viewed only by illuminating the coded area with a laser device and looking at the refracted light projected onto a screen at right angles to the hologram.

> A maximum of 5 characters is required which can be a combination of letters and numbers.

Dual Axis CLR (Covert Laser Retrievable) – *Tier 2*
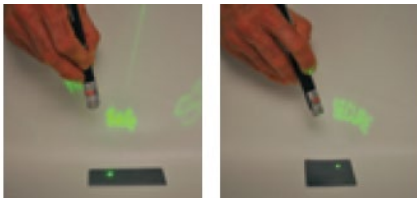
Similar to Single Axis CLR, Dual Axis CLR projects two different images at 90° angles from one another.

> A maximum of 5 characters is required for each axis. This can be a combination of letters and numbers.

Micro Imagery – *Tier 3*

Actual Size

Enlarged Image

True color images or photographs that are reduced in size to three square millimeters, and require the use of a loupe or magnifying glass to authenticate.

> Preferably the image should be a high resolution image. This feature works best with real life images. The minimum size is 3mm square and good examples would be flowers, locations or flags. National symbols can be used.
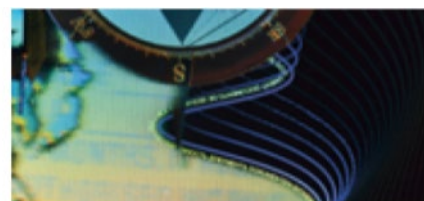
Animated CLR (Covert Laser Retrievable) –
Tier 4
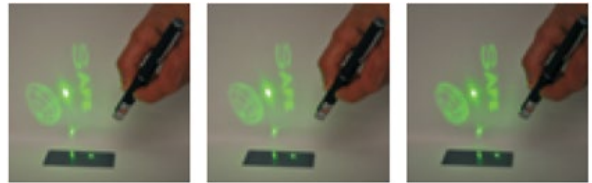
Multiple images are slightly and sequentially rotated, giving the appearance of animation when holding an ID document stationary and moving a laser across the CLR.

> A maximum of 8 characters is required which can be a combination of letters and numbers.

Micro Text – *Tier 2*

Diffractive or non-diffractive text that can be as small as 175 microns high, and require the use of a loupe or magnifying glass to be clearly viewed.

> The text must be Arial font of 0.7pt or larger. Can be combined with fine line Guilloche and Rainbow coloring.

FORENSIC FEATURES

Nano Text – *Tier 3*

Diffractive or non-diffractive text, from 40 to 175 microns, that can be clearly viewed only through a microscope.

> The text must be Arial font. For a Patch or Overlay product the minimum recommended font size is 0.2pt and the maximum 0.6pt. Microscope is needed for authentication.

Brick Matrix Manipulation – *Tier 3*

To manipulate the size/shape of each brick, in order to make more complex shapes in a small (previously specified) sector of the design. These tiny features can only be found using a microscope with prior knowledge of their existence.

> Can be used to hide one spelling mistake at a specific place in repeated micro text. This feature can be applied to any area of the holography.
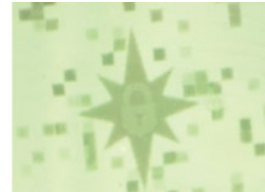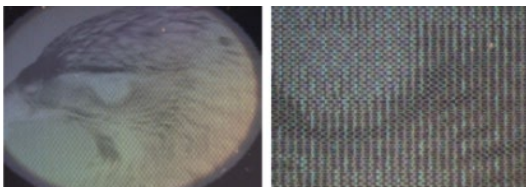
Nano Imagery – *Tier 4*

Image that can be clearly viewed only through a microscope.

> The recommended minimum size for the image is 25 microns.

MULTI-LEVEL FEATURES

Line width Modulation (LWM) – *Tier 3*

Various image and text effects that can be created by the mathematical manipulation of width, length and height of lines.

> Lines should be no smaller than 0.25pt.