

TAVANA ENERGY LLC
7901 Hispanola Ave. Suite 1611
North Bay Village, FL, 33141
USA
Telf.: 1-954-253 0358
E-mail: info@tavanaenergy.com
FEIN 320476842

PROFORMA INVOICE	
07/2022	08/16/2022
Trans. Date	Page
	1 of 1
CUSTOMER NO.	LOCATION
101	IGM (ECUADOR)

Bill to: **INSTITUTO GEOGRAFICO MILITAR**
RUC:1768007200001
Seniergues E4-676 y Telmo Paz y Miño
QUITO. ECUADOR
Telf.: +593-2-3975100

Terms: 70% EN CALIDAD DE ANTICIPO, EL SALDO CORRESPONDIENTE AL 30%, 5 DIAS DESPUES DE SUSCRITA EL ACTA DE ENTREGA RECEPCION DEFINITIVA

Prices: USD, CPT AEROPUERTO DE QUITO - PUERTO DE GUAYAQUIL

Delivery Time: Primera entrega : 600 rollos (300,000 láminas)95 días CPT aeropuerto Quito a partir de la recepción de la orden de compra
Segunda entrega : 850 rollos (425,000 láminas) 117 días CPT aeropuerto Quito contados a partir de la recepción de la orden de compra

TECHNICAL WARRANTY
Será de un año calendario a partir emisión del acta entrega- recepción de la láminas en las mismas características descritas en las especificaciones técnicas y en perfectas condiciones físicas, para su uso inmediato.
De existir láminas holográficas de seguridad que tengan defectos de fabricación y/o durante el transporte, embalaje, o que afecten su uso normal, que perjudique el correcto funcionamiento de la lámina holográfica de seguridad serán reemplazadas en un plazo máximo de 30 días calendario posterior a la notificación, sin costo alguno para el IGM en sus instalaciones.

Validity of the quote: 60 días calendario.

APROBACIONES EN FABRICA
Precios Incluyen, viaje de 2 delegados del IGM a la imprenta de seguridad Surys en Paris, Francia para aprobacion de todas las características objeto del contrato. Los costos que se generen por el traslado, seguro, hospedaje y alimentación del Administrador de Contrato u Orden de Compra y del Técnico serán asumidas por Tavana Energy, LLC ** diseño presentado en la ficha tecnica, es basado en el plano mecanico que se publica en las especificaciones tecnicas del concurso.

Consultoria Internacional para la verificacion de las láminas holográficas.
Se entregará un listado de 3 consultores internacionales reconocidos internacionalmente en un plazo máximo de 5 días a partir de la recepción de orden de compra o suscripción del contrato. Las verificaciones de las láminas holográficas de seguridad para los pasaportes electrónicos serán coordinadas con el responsable de la orden de compra u administrador de contrato, sin costo adicional para el IGM.

Item	PRODUCTO	FORMATO	QUANTITY (ROLLOS) - 725.000 LAMINAS	UNIT PRICE	TOTAL PRICE (CPT AEROPUERTO DE QUITO)
1	Láminas holográficas de seguridad para el pasaporte ecuatoriano cumpliendo con todas las especificaciones técnicas y de seguridad requeridas que adjuntamos en nuestra ficha tecnica CPC 363300111	ROLLOS	1,450	\$ 488.00	\$ 707,600.00
		TOTAL ROLLOS	1,450	TOTAL CPT AEROPUERTO DE QUITO	\$ 707,600.00

Atentamente,

TAVANA ENERGY LLC

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SURYYS
INGROUPE

ECUADORIAN PASSPORT PROJECT



scale : 100%

PROJECT PASECU	
 PRE-STUDY #01	 02 08 2022
 125x88 mm	 Parc Gustave Eiffel - 22, avenue de l'Europe, Bussy-St-Georges - 77607 Marne la Vallée Cedex 3 - FRANCE Tel. : +33 (0)1 64 76 31 00 - Fax : +33 (0)1 64 76 35 70



scale : 100%

1st LEVEL AUTHENTICATION

- ① DID™ 90° color permutation
- ② DID™ Virtual
- ③ High diffractive colors
- ④ Dual Axis Diffractive Animation
- ⑤ Gradual Iridescent Morphing
- ⑥ Wide Angle Iridescent Animation
- ⑦ White Diffractive Animation
- ⑧ Vertical Achromatic Switch
- ⑨ Achromatic Switch
- ⑩ Lower Reflective On MRZ Area
- ⑪ Oblique Angle

2nd LEVEL AUTHENTICATION

- ⑫ 180° Control
- ⑬ DID™ Polarization Effect
- ⑭ Micro-Texts

3rd LEVEL AUTHENTICATION

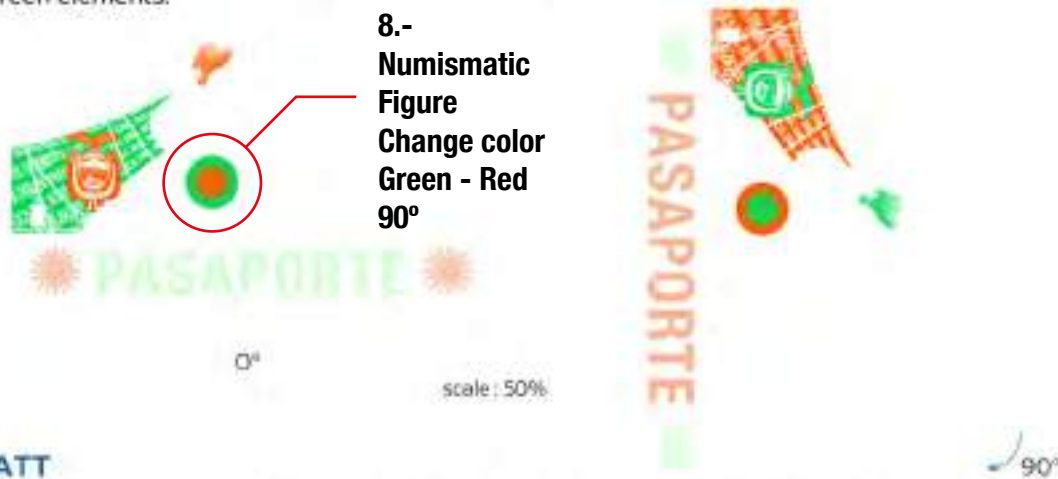
- ⑮ Nano-Photo
- ⑯ Nano-Texts

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① DID™ 90° COLOR PERMUTATION

When seen at direct reflective angle, the hologram shows two reflective colors, a sun and the Ecuador coat of arms in red color and their respective backgrounds in green color.
When the hologram is rotated 90°, a color permutation appears between the red and the green elements.



8.-
Numismatic
Figure
Change color
Green - Red
90°

DID™ MATT

The reflective colors contain a matt area in the Suns and the text «PASAPORTE» that offers an extended viewing angle under a point source.



② DID™ VIRTUAL

The ECUADOR MAP, in reflective color shows a 3D relief effect.

2.-
Surface
3D relief
effect

scale : 300%



③ HIGH DIFFRACTIVE COLORS

High diffractive colors are assigned to different elements :

- Coat of arms of Ecuador
- Geographical lines
- Text «REPUBLICA DEL ECUADOR»

9.-
Geographical Lines

10.-
Change Color bright and colorful
"República del Ecuador"

1.-
Shield of
Ecuador
in color



scale : 50%



4 DUAL AXIS DIFFRACTIVE ANIMATION

The text «Republica del Ecuador» combines an achromatic diffractive animation at 0° and a colored diffractive animation at 90°.



ACHROMATIC DIFFRACTIVE ANIMATION

Upon a vertical tilt, an achromatic animation appears on the text «REPUBLICA DEL ECUADOR». The animation shows a vertical movement in the first text and an horizontal movement in the second text.

3.- Achromatic animation vertical movement

4.- Achromatic animation horizontal movement

República del ECUADOR República del ECUADOR

scale : 100%



LATERAL DIFFRACTIVE ANIMATION

After a 90° rotation and a left/right tilt, a colored diffractive animation appears on the texts.

República del ECUADOR
República del ECUADOR

scale : 100%

90°



5 GRADUAL IRIDESCENT MORPHING

When the hologram is tilted top to bottom, a bright iridescent effect expands gradually from the white diffractive «E» to the map outline. A white pumping effect is added around the map.



scale : 100%

5.- Transition shape "E" to Ecuador profile



6 WIDE ANGLE IRIDESCENT ANIMATION

When the hologram is moved top/bottom on a very wide viewing angle, high diffractive colored guilloches and text «ECUADOR» are animated.



scale : 50%

6.- Rosette Guilloche Transition color moved top/bottom

5.- Transition shape "E" to Ecuador

7 WHITE DIFFRACTIVE ANIMATION

When the hologram is tilted from left to right, white diffractive guilloches and the text «REPUBLICA DEL ECUADOR» in the center are animated.

6.- White diffraction guilloche



scale : 300%

8 VERTICAL ACHROMATIC SWITCH

The text «REPUBLICA DEL ECUADOR» and the ring in background appears in bright achromatic color and shows a positive to negative effect upon vertical tilt.

6.- 2 Circles Text “República del Ecuador” transition positive / negative



scale : 100%

9 ACHROMATIC SWITCH

When the hologram is tilted from left to right, the achromatic monument and the sun are permuting positive to negative alternatively.

6.- “Mitad del Mundo” monument and sun transition positive / negative



scale : 500%

10 LOWER REFLECTIVITY ON MRZ AREA

The MRZ area is covered by a specific gloss reduction technology which renders this surface reflectivity significantly lower than the personal data ones. It delivers the following functionalities:

- Enhanced readability for all type of MRZ readers
- DID™ matt noticeable on the SUN and the text «PASAPORTE» compatible with this feature

19.- Expansión Effect



scale : 50%



11 OBLIQUE ANGLE VIEW

When the laminate is observed under a light source with a specific very oblique angle, the tinted mat area bears an iridescent color in :

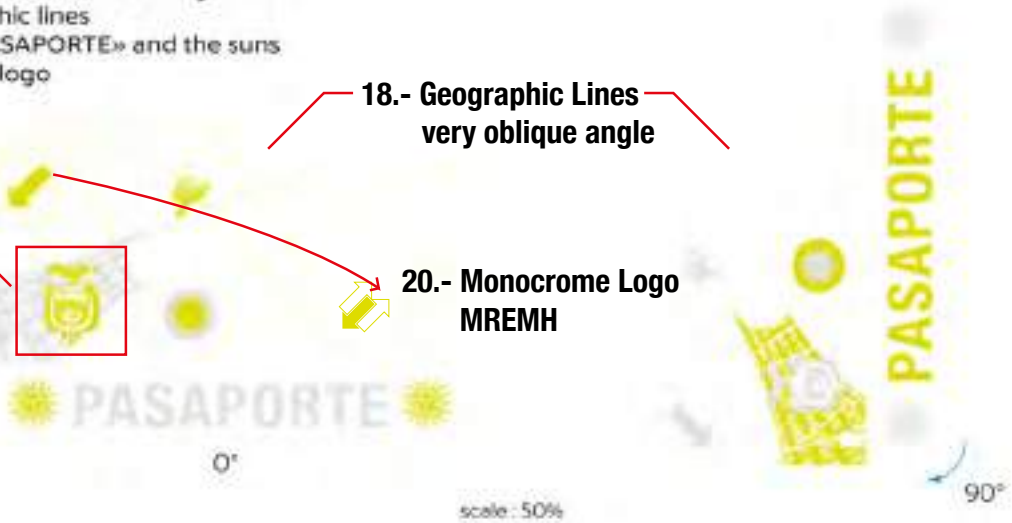
- the coat of arms and its background
- the geographic lines
- the text «PASAPORTE» and the suns
- the MREMH logo

17.-
Shield of
Ecuador
very
oblique
angle
owner's
photo



18.- Geographic Lines
very oblique angle

20.- Monochrome Logo
MREMH



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12 180° CONTROL

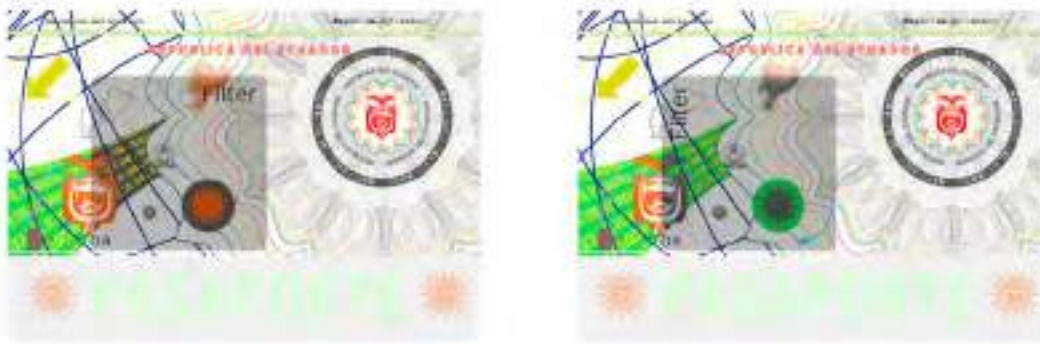
At closer examination the vertical achromatic switch can be observed upon 180° rotation in the document's plan

7.- Control 180°



13 DID™ POLARIZATION EFFECT

DID™ reflective colors are selected one by one when viewed through a polarized filter. The selected color changes alternately with each 90° rotation of the filter.



14 MICRO-TEXTS

Micro-texts readable with a magnifier (x10).

- two lines of colored micro-texts on the top of the laminate
- One line of matt micro-text in the bottom.



12.- Tow lines Micro texts Colorful

13.- One line Micro texts matt

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15 NANO-PHOTO

Very high definition nano-photo for forensic inspection (\geq x100 microscope).



scale : 500%

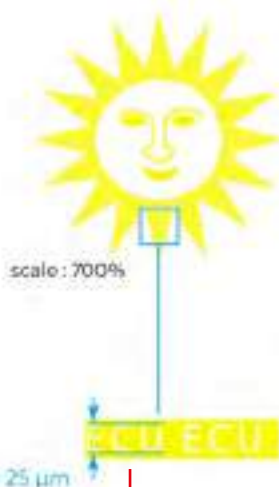
15.- Nano Photo



16 NANO-TEXTS

Very high definition nano-texts pattern for forensic inspection (\geq x100 microscope).

16.- Area Code diffractive color, specific to Ecuador (3rd Level Confidential)



14.- Nano texts



scale : 100%

- 100% compatible with Muhlbauer ID 60 laminator roll format, 500 laminates per roll
- 100% compatible with Ecuadorian System of National ID and Passports Emission System JURA
- Adherence temperature activation : 105-115°C
- Transporter made of synthetic material 100% compatible with Muhlbauer ID 60 laminator(88 x100 mm)
- Curing time :48 hours max :resistant to be removed using : extreme heat/cold,polar solvents,non polarized solvents, chlorine solvent ,acids , bases
- Ultra high security synthetic laminate, long term durability of 10 years
- Ultra thin laminate : thickness between 5μ and 10μ, 125 mm x 84 ± 0.5 mm format
- 100% vectorial securities generation, not raster ,can not be generated for commercial use
- Diffractive laminate design will not affect reading of MRZ zone
- All of our products are guaranteed for 1 year from the delivery date



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Technical Documentation
OPTOSEAL™ ULTRAn & DID™
WAVE VIRTUAL
ALPHAGRAM™ optical
securities

Thin laminate delivered in roll for Passport
Personalization Lines

Technical Documentation
Version 1.1 : 08/2022

Your contact :

Camille COSSEC

Mobile: +33 671581480

Camille.cossec@ingroupe.com

SURYYS – IN GROUPE

22 Avenue de l'Europe - Parc d'Activités Gustave Eiffel

Bussy Saint Georges

77607 Marne la Vallée Cedex 3 – France

Tél : +33 (0)1 64 76 31 00

ingroupe.com



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These recommendations apply to all pages of this document.

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1. OVERVIEW

SURYS, high security holographic foils manufacturer, is participating in many projects of identity documents issuing. SURYS actually supplies holographic passports laminates to numerous countries as, among others, France, Egypt, Brazil, Philippines....

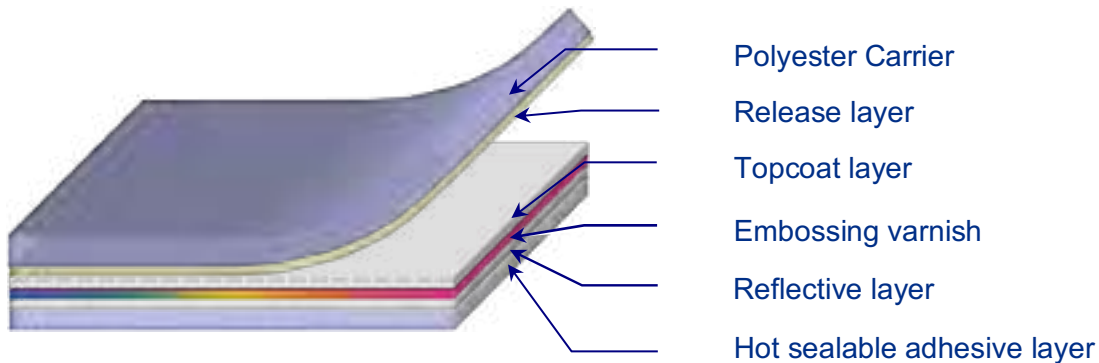
This document describes SURYS' **OPTOSEAL™ ULTRAn**, holographic lamination film delivered in reels, for the protection of passport data pages after personalization printing.

2. STRUCTURE & PERFORMANCES

2.1. Foil structure before application

OPTOSEAL™ ULTRAn laminate for passports is a polyester base film coated with a High Refractive Index layer and then with a specific thermo-reactive adhesive layer.

The foil in the bobbin has the following structure:



- Polyester Carrier: typically 19 micrometer thickness (for IB60 hardware, Thickness is 36µm)
- Release layer: This layer, activated during the lamination, allows the peeling of the polyester carrier from underneath layers. Only the holographic and adhesive layers remain on the passport page
- Topcoat layer: layer in order to increase the abrasion resistance, chemical and thermal aggression of the film.
- Embossing varnish: This varnish layer is embossed using the approved origination. The holographic image is embedded into this layer, generating a complex optical micro-structure.
- Reflective layer: This layer is coated with HRI (High Refractive Index) layer using vacuum thermal evaporation process. In case of demetallization, metallic elements exist underneath this HRI layer.
- Adhesive layer: The film is then coated with a dedicated thermo-reactive adhesive for optimal bonding to the passport data page.

Technical point for ID60 Laminate foil: For the Mühlbauer ID60, requirement is to have a polyester Carrier with a different thickness. For this foil, we implement a Polyester Carrier with a thickness of 36µm

2.2. Foil structure after lamination onto Passport data page

After lamination, remaining layers on the passport data page are:

- Topcoat layer
- Embossing varnish
- HRI Reflective layer
- Adhesive layer

⇒ **The thickness of the layers remaining on the passport data page is less than 10 microns.**

2.3. Lamination conditions

In order to comply with most specifications of resistance and durability, **OPTOSEAL™ ULTRAn** must be laminated in the following temperature conditions (real values on the surface of the data page surface measured by the mean of thermo-reactive stickers):

- Min.: 105°C
- Max.: 115°C

For each project, SURYS develops the specific adhesive to be coated on the holographic film. The bonding performance depends on:

- the substrate (paper surface, possible presence of reactive agents...)
- the printing (ink quality, nature of ink, ink coat weight,...),
- the lamination conditions (dwell time, temperature and pressure)

The developed adhesive has no influence on the printed data page : security background, variable data.

2.4. Performances

The performances of the Optoseal™ laminate directly depend on the temperature, pressure and speed of the laminator. With a proper adhesive tuned to the paper and using optimized lamination settings, SURYS films demonstrated superior resistance to abrasion, chemical aggressions, temperature and light fastness.

Prior starting a production batch, SURYS performs tests on the final printed paper in order to tune the adhesive to the substrate. The laminate must be applied in accordance with the setting values described in "Lamination conditions" section.

Normative references

The production by SURYS of the **OPTOSEAL™ ULTRAn** is made within the frame of several security certificates, among others:

- ISO 9001, Quality Management Systems
- ISO 14001, Environmental Management System
- ISO 14298, Management of security printing processes, INTERGRAF

⇒ **Optoseal™ laminates are fully ICAO compliant.**

2.4.1. Mechanical resistance

Tear resistance

After applying a test tape (Tesa tape 4104) onto the laminate on the data page, the test tape is ripped from the layer.

⇒ *In some cases, some paper areas may be removed with the laminate, showing that the bonding between the laminate and the passport is stronger than the internal cohesive strength of the paper.*

Resistance to Abrasion: TMI Ink Rub tester

The TMI Ink Tub Tester is designed to provide a means of testing the abrasion resistance. The specimen is fastened to a test block and is moved through an arc of 2,25" (57,2 mm). The specimen is moved through this arc a predetermined number of cycles, at a predetermined speed.

⇒ *The data page should remain machine readable under the tested laminate.*

2.4.2. Stability to light

Light resistance is tested with a SUNTEST CPS exposure system. (Wavelength: 300 to 800 nm, light power = 250 W/m²) Test duration = 24 hours, which corresponds to the opening of the passport one minute per hour during ten years.

⇒ *No alteration in the laminate functionalities.*

⇒ *All security features of the laminate remain recognizable.*

2.4.3. Resistance to chemicals (ICAO tests)

The laminated passport data page is submerged in the following chemicals:

- Acids
- Basis
- Solvents

⇒ *The personalization data should stay visible.*

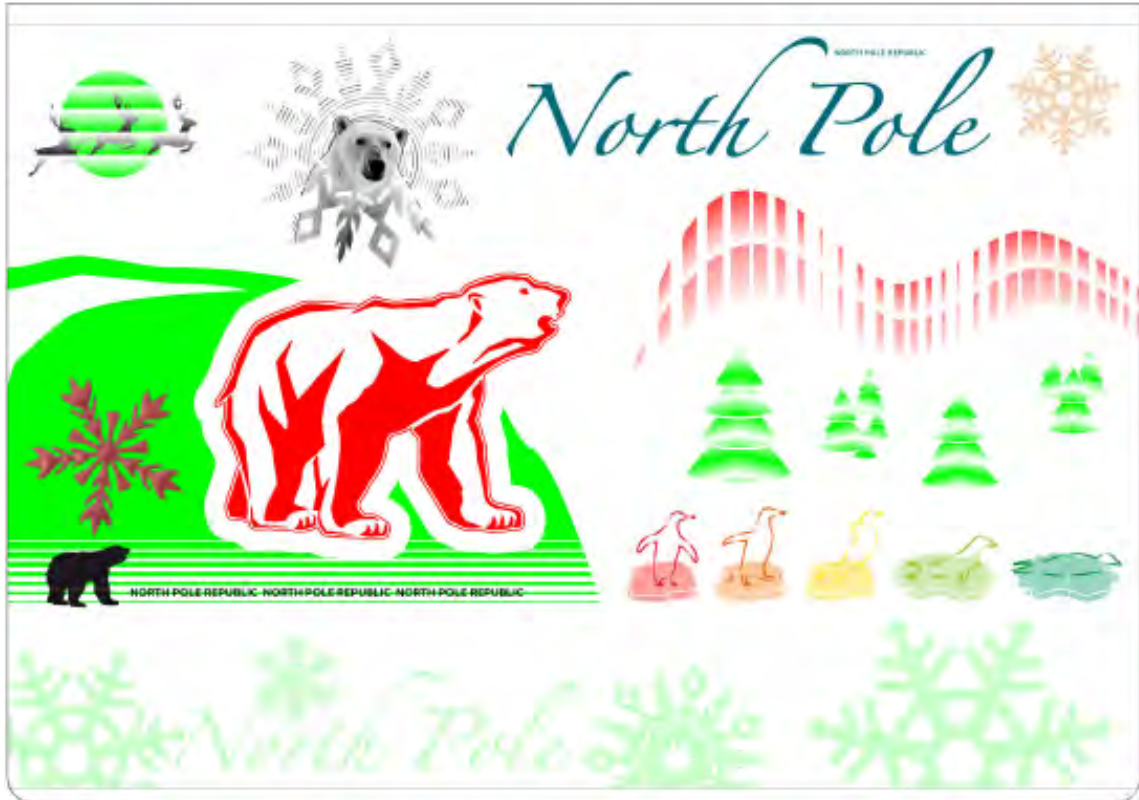
2.4.4. Storage Temperature Stress Method

The laminated passport data page is placed in climate controlled chamber at temperature ranging from -35°C to +80°C for 168 hours

⇒ *The MRP should not lose its reliability due to changes in the laminate.*

3. OPTICAL SECURITIES: DID™ WAVE VIRTUAL ALPHAGRAM™

The OPTOSEAL™ ULTRAn allows the integration of various optical securities such as DID™, with Wave and Virtual effects, combined with Alphagram™. The design here below exhibits an example of this combination:



3.1. 1st level authentication features



3.1.1. DID™ 90° Color Permutation

When seen at direct reflective angle, the hologram shows two reflective colors. When the hologram is rotated 90°, a color permutation appears.

This unique DID™ effect is really efficient under diffuse illumination conditions, this is an easy recognizable element for 1st level visual authentication.

3.1.2. DID™ WAVE and DID™ VIRTUAL

DID™ WAVE: A part of the design in two reflective colors shows a dynamic surface animation. When tilted vertically one reflective color is moving up whereas the second one is moving down.

DID™ VIRTUAL: One element in reflective color shows a 3D relief effect.

DID™ Wave and DID™ Virtual are unique combinations of DID® technology with motion and 3D relief effects, dedicated to Government documents. It offers a very easy control on multiple first level criteria: variation in color by 90° permutation, variation in motion with colors moving in opposite direction under vertical tilting and variation in perception with colored 3D effect. All variations rely on DID® colors and its proven strength as a top level Optical Security feature for Governments documents.

3.1.3. Wide angle iridescent animation

When the hologram is moved Top/Bottom on a very wide viewing angle, high diffractive colored elements are animated:



3.1.4. High diffractive colors

High diffractive colors are assigned to different elements:



3.1.5. White diffractive animation

When the hologram is tilted Left/Right, diffractive elements are animated:



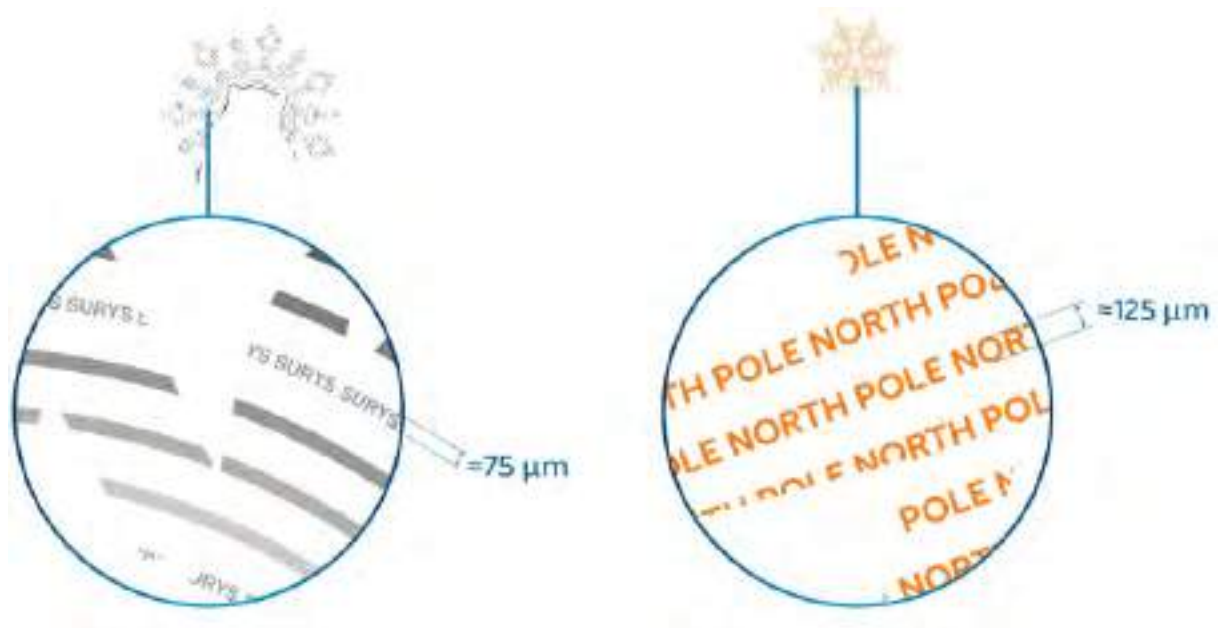
3.2. 2nd level authentication features

3.2.1. DID™ polarization property

DID™ has an intrinsic property which can be checked with a simple tool like a polarizing filter: by rotating the polarizing filter, one color is selected preferentially to the other.

3.2.2. Micro-Text

Micro-Text readable with a magnifier (x10):



3.3. 3rd level authentication features

3.3.1. Nanograph

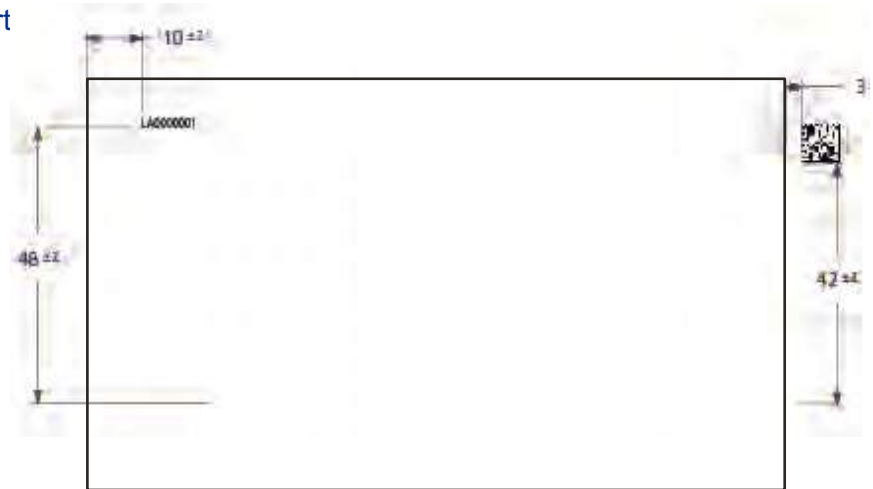
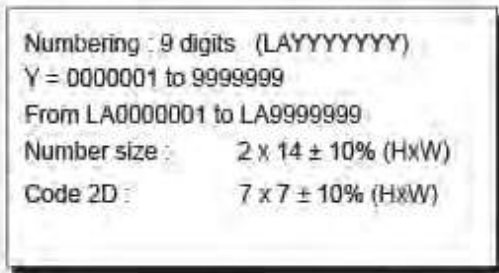
Nanograph only visible with a magnifier (x100):



4. NUMBERING (OPTION)

The film laminated on the passport

As an example:



This number can be:

- Directly readable, or barcode
- Transferred with the lamination, visible on the laminated film or not transferred
- Transferred and not visible: printed with invisible ink UV-fluorescent

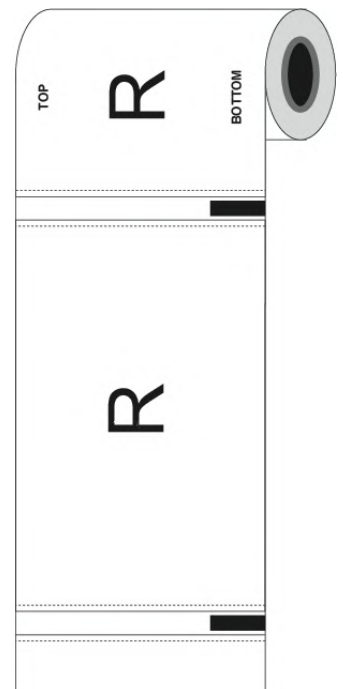
5. PRODUCT CONFIGURATION

5.1. Roll Layout

Rolls of **OPTOSEAL™ ULTRAn** security laminates are designed for desktop passport laminators (working with rolls) and online or modular systems. Among others, reels can be designed for **SURYS laminators**, Mühlbauer, Datacard, Diletta, Ruhlamat, IAI (Industrial Automation Integrators) ...passport personalization equipments.

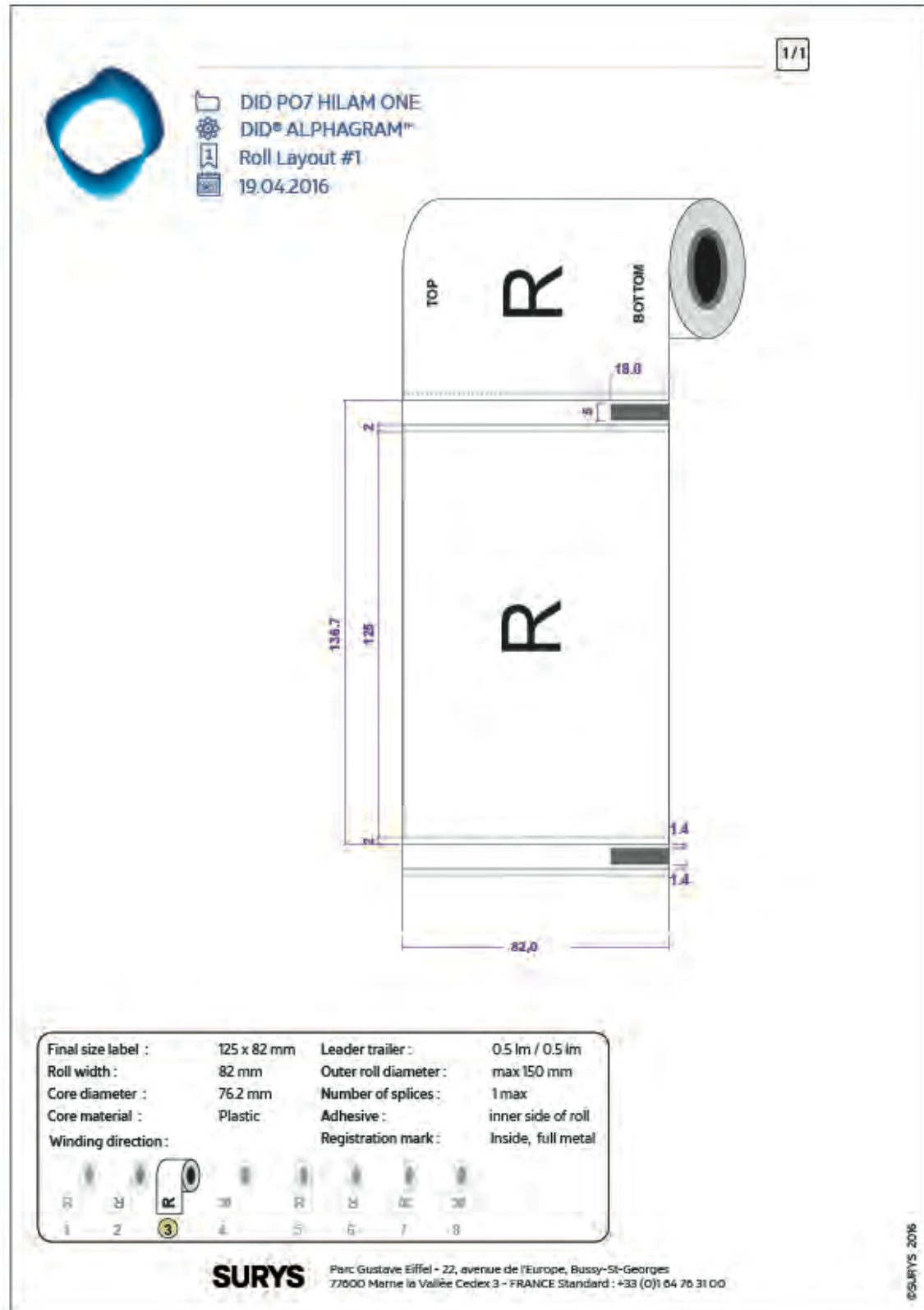
Final format depending upon the roll layout of the selected personalization/lamination system, the final roll layout shall be agreed between the customer and SURYS. Main characteristics of reels are:

- Quantity of images per roll
- Roll width
- Inner core dimension (1inch, 3 Inch...)
- pitch between 2 images
- Eyemark for detection of images: these eyemarks can be transparent diffractive, black printed or metallic (in case of foil with demetallization)
- Leader/trailer: beginning and end of roll without holographic images.



5.2. Example

As an example, here after is described one of the roll configuration dedicated to SURYS' **HILAM™ One** laminator:



6. PACKAGING

6.1. Reels

Each reel is identified by a label and placed in a polyethylene bag. The following information are on the label:

- Product name & number
- Production Batch Number
- Date of manufacture/shipping
- Qty of holograms in the roll (could be less than 260)
- Product (roll) number in this batch
- Barcode including batch number.



6.2. Box

The reels are placed into cardboard boxes. The empty space between the reel and the inner edges of the cardboard is filled with foam or alike.

The boxes are then sealed with holographic seals. All boxes are placed in secure containers to prevent their opening for instance in case of an accidental fall.



6.3. Shipping container

If necessary, depending on the delivered quantities, cardboard boxes are placed into containers (big boxes), on a pallet.

The pallet is sealed then wrapped in transparent foil. The container is labelled with the shipping information.



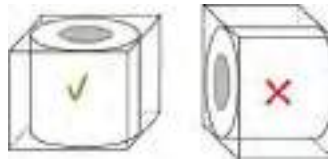
7. STORING AND SHELF LIFE OF REELS

12 (twelve) months in original packaging.

Products must be protected from light and stored under the following normal conditions of temperature and humidity):

- Temperature: 10 - 25°C
- Relative Humidity: 50% +/- 5% at 20°C

Rolls must be stored upright, as described on the opposite picture:



8. PROJECT MANAGEMENT

Expert in developing security solutions for identity documents, SURYS has consequently acquired an experience in project management for such developments. Several development, validation steps and production steps lead to the security laminate delivery:

8.1. Identification of the expected solution

- Chosen optical security solution (Alphagram®, DID®, demetallization, ...)
- Graphical elements for the design creation
- Information relative to the equipment using the laminate,
- Substrate identification (for the definition of the adhesive)
- Expected delivery time
- Technical specification

8.2. Graphic proposal

On the basis of visual elements or indications or files given by the Customer, several graphic proposals are proposed by SURYS to the Customer. The Customer gives his feedback on these proposals, choosing one of the options as a basis of discussions. The graphic proposal is then updated in order to correspond perfectly to the customer's request. Optionally a computer simulation of the hologram can be done from previsualization software developed by SURYS (Holoview®).

Then, the last version of the graphic proposal is validated by the Customer, the Mastering step is launched.

Files exchanges Different solutions can be proposed by SURYS for the exchanges of graphic files: encrypted pdf file with a password, securized FTP server from SURYS, PGP...

8.3. Mastering (Visual validation)

The Master is then created on the basis of the signed Graphic Proposal which contains all the security features requested by customer.

8.4. Structure Qualification (Functional qualification)

In the meantime, once the final personalization equipment are known and samples of substrates given by the Customer to SURYS, tests are done by SURYS to determine the product structure and samples with standard images are supplied by SURYS to the customer for qualification on the personalization equipment chosen by the customer.

8.5. Production & delivery

The production of the holograms is launch after receipt of the Customer's approval on the Graphic Proposal. During this period of time, until the delivery of the goods, the Project Manager will be the interface with the Customer for any technical item related with this production.