[CST]
CRIME SCIENCE TECHNOLOGY

FRONTEX
EUROPEAN BORDER AND COAST GUARD AGENCY

[redacted]

# *O.V.M® – Optical Variable Material Technology*

[redacted]

December 10th, 2021

[CST]
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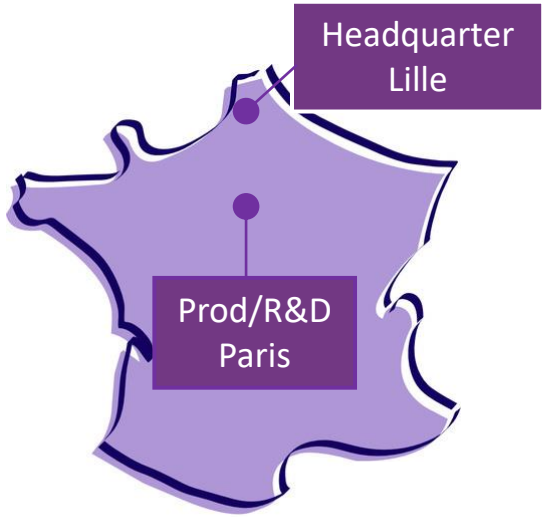


- Founded in 2010
- French Privately Owned Company – COVESTRO as minority shareholder
- Management team with a solid background in Security Industry

- Member of

SECURE IDENTITY ALLIANCE

DSA
ENHANCING DOCUMENT AND IDENTITY SECURITY

# DESIGNING MOLECULES FOR A SAFER WORLD

**Activity**

Combining chemical properties & optical effects for :

- Authentication of official documents (ID/Banknotes)
- Identification of people (forensic)

**Customers**

- Governements / Security printers / Integrators
- National Forensic Laboratories : Police Forces

# Business Areas

Forensic

Banknotes

ID documents

# New Trends for ID Documents

# ID Market

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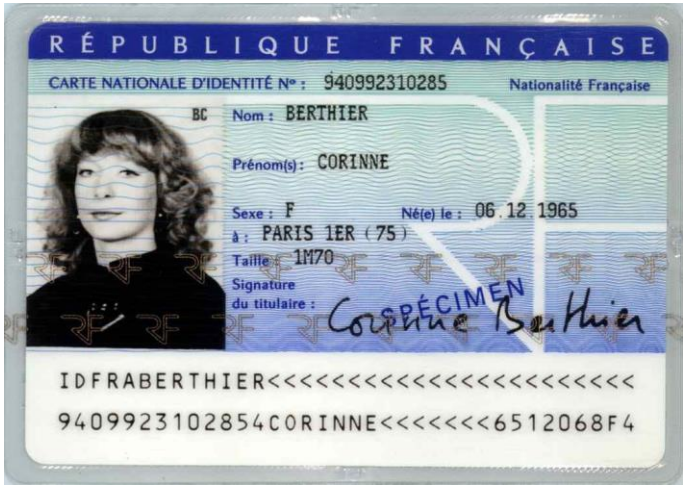
## *Trends*

## ID docs move to full polymer.

Strong trends for most of

- National ID cards,
- Driving Licence
- DataPage **PC datapage**

volume x 3 in the next 10 years
=> 75% of the countries




1995


2021

*Trends*

# Transparent areas in ID docs


**Polycarbonate allows Transparent areas in ID documents**

--> 70% of  of new PC datapages in 2020 with transparent areas


*Trends*

# Transparent areas in ID docs

⇒ A transparent area adds some complexity to counterfeit

⇒ But a simple clear window is not enough by itself

White card available on the web

Trends

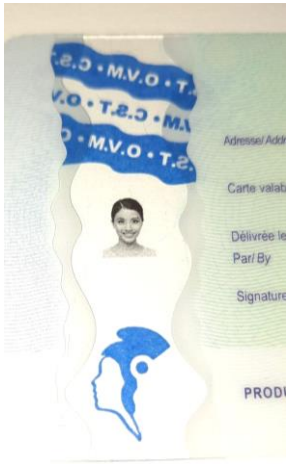
# Transparent areas in ID docs

⇒ **a clear window is not enough by itself**

**Design and functionality will protect security document**

Recent evolutions :

- Complex shape
- Asymetrical window
- Combined with security features

# OVM TECHNOLOGY

# O.V.M® Optical Variable Material

## Disruptive Security Feature For ID Documents

- **Specific security feature for transparent areas**
- **Innovative visual effect**
  **Authentication at a glance**
- **Strong Level 1 and level 1/ 1+ / 2 / 3 = All Combined**
- **Patented security feature**
- **Easy to integrate in industrial processes**

# Flexibility

## 2 industrial integration processes

O.V.M™ Fiduciary Polycarbonate

**OVM Polycarbonate film**
**Makrofol ID O.V.M (Core card)**

O.V.M™ Fiduciary Inks

**OVM Fiduciary Inks**
**(Core card)**

- No additional equipment
- Processes already mastered & qualified by security industrials

# A new generation of high security features combining innovative visual effects and robustness

**O.V.M™**
Fiduciary
Polycarbonate

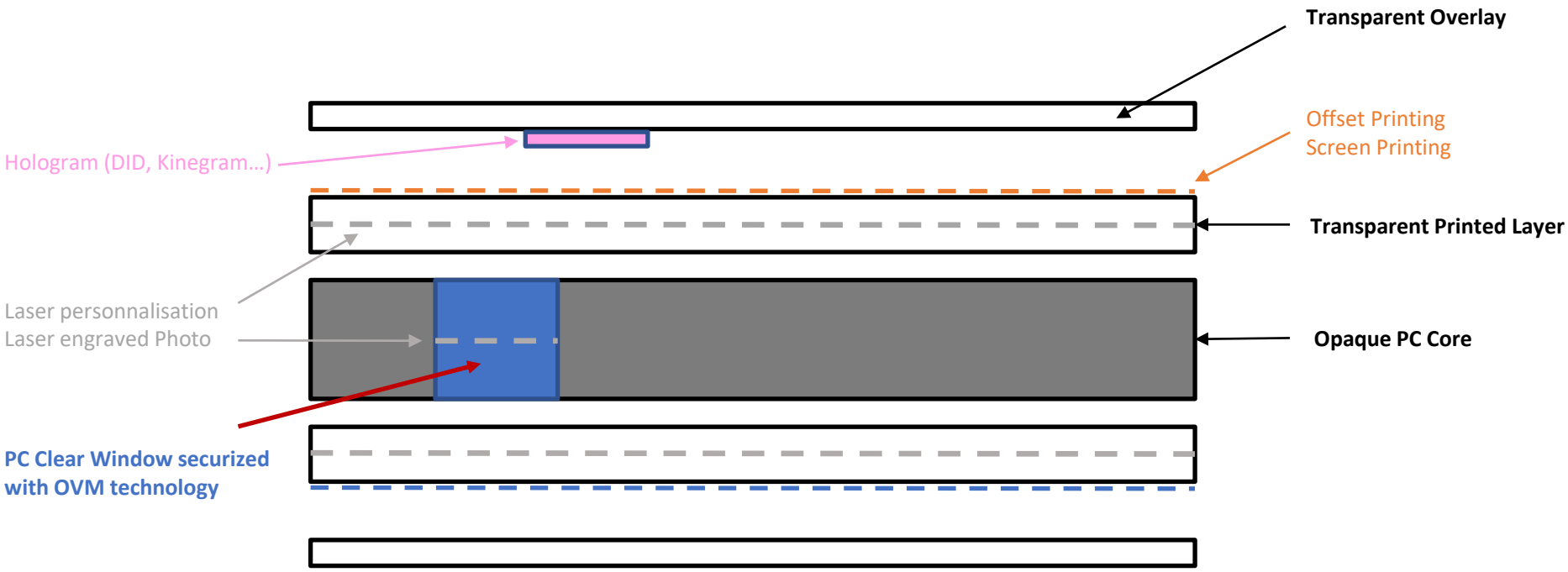
**O.V.M™**
Fiduciary
Inks

**O.V.M™**
Dynamic
Shifting Image

# O.V.M™ Fiduciary Polycarbonate

# Card structure

- ✓ **Light resistance**
- ✓ **Delamination resilient**
- ✓ **Core card security feature**



# O.V.M Technology

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**O.V.M™ Fiduciary Polycarbonate**

## ColorShift LEVEL 1


The transparent area of the ID document changes color according to the background (White or Dark) on which it is displayed. E.g. Green on White surface and Red on Dark surface. It is an innovative security feature, highly intuitive and easy to remember.

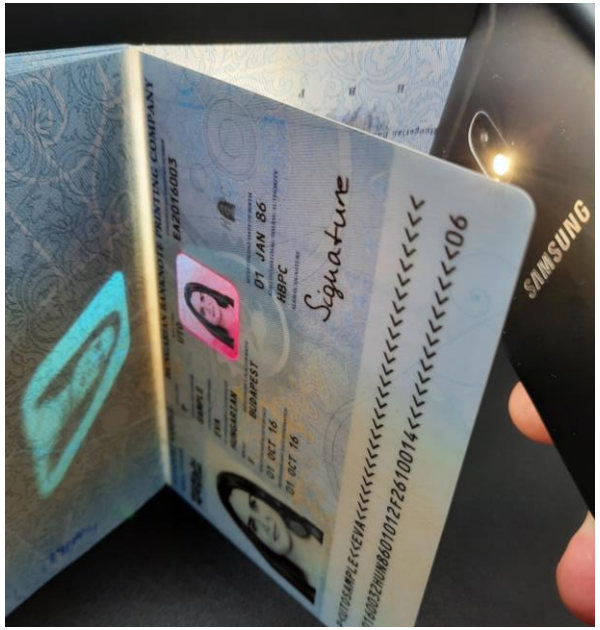
# O.V.M Technology

O.V.M™ Fiduciary Polycarbonate

## SmartShadow

LEVEL 1+

WITH A SMARTPHONE FLASHLIGHT



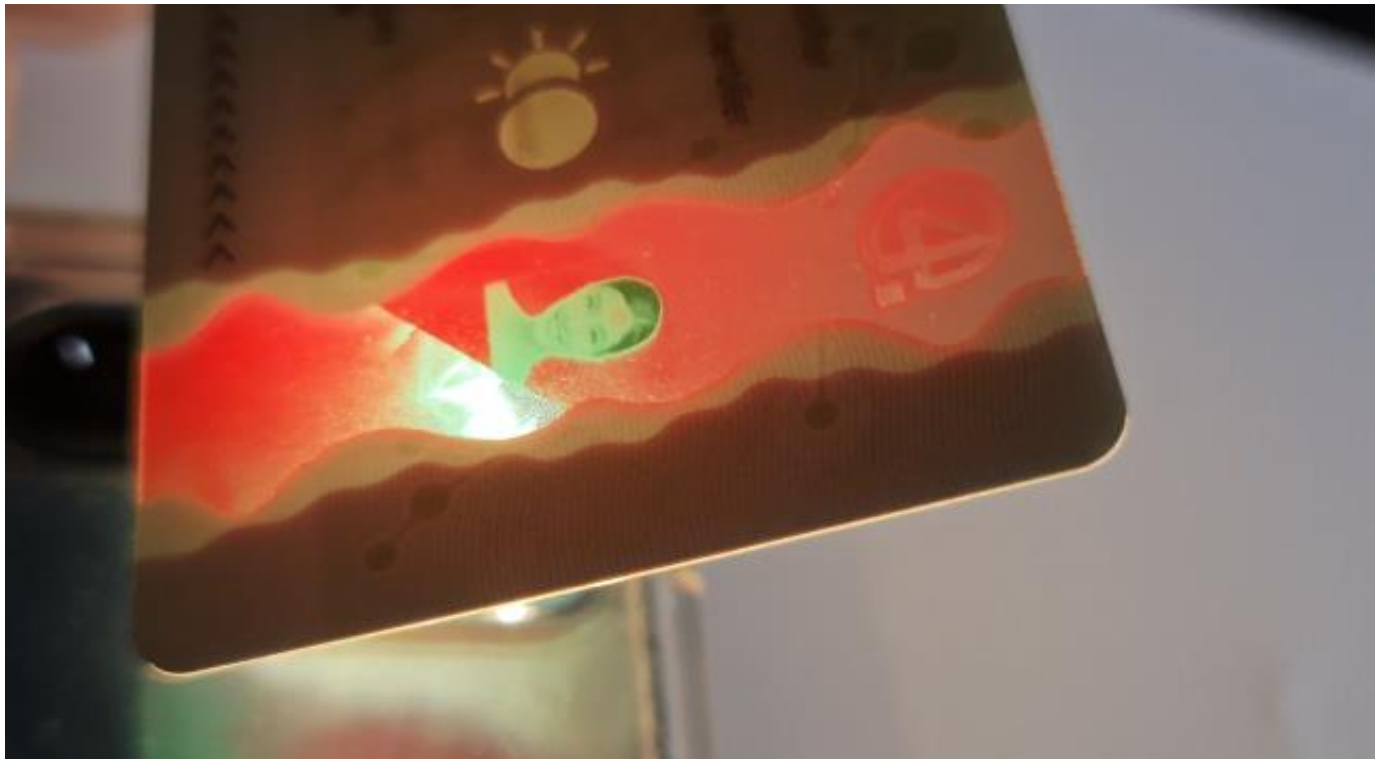


It is a new level of verification between level 1 and level 2, observable thanks merely to equipment readily available to the general public: the flashlight of a smartphone (or any other conventional white light source). For example, the transparent area turns Red while its projected shadow remains Green.

# O.V.M Technology

O.V.M™ Fiduciary Polycarbonate

Datalock LEVEL 1+ WITH A SMARTPHONE FLASHLIGHT



Laser personalization is now secured with OVM Fiduciary polycarbonate.
The entire windows changes color expected the personalized datas

# O.V.M TECHNOLOGY

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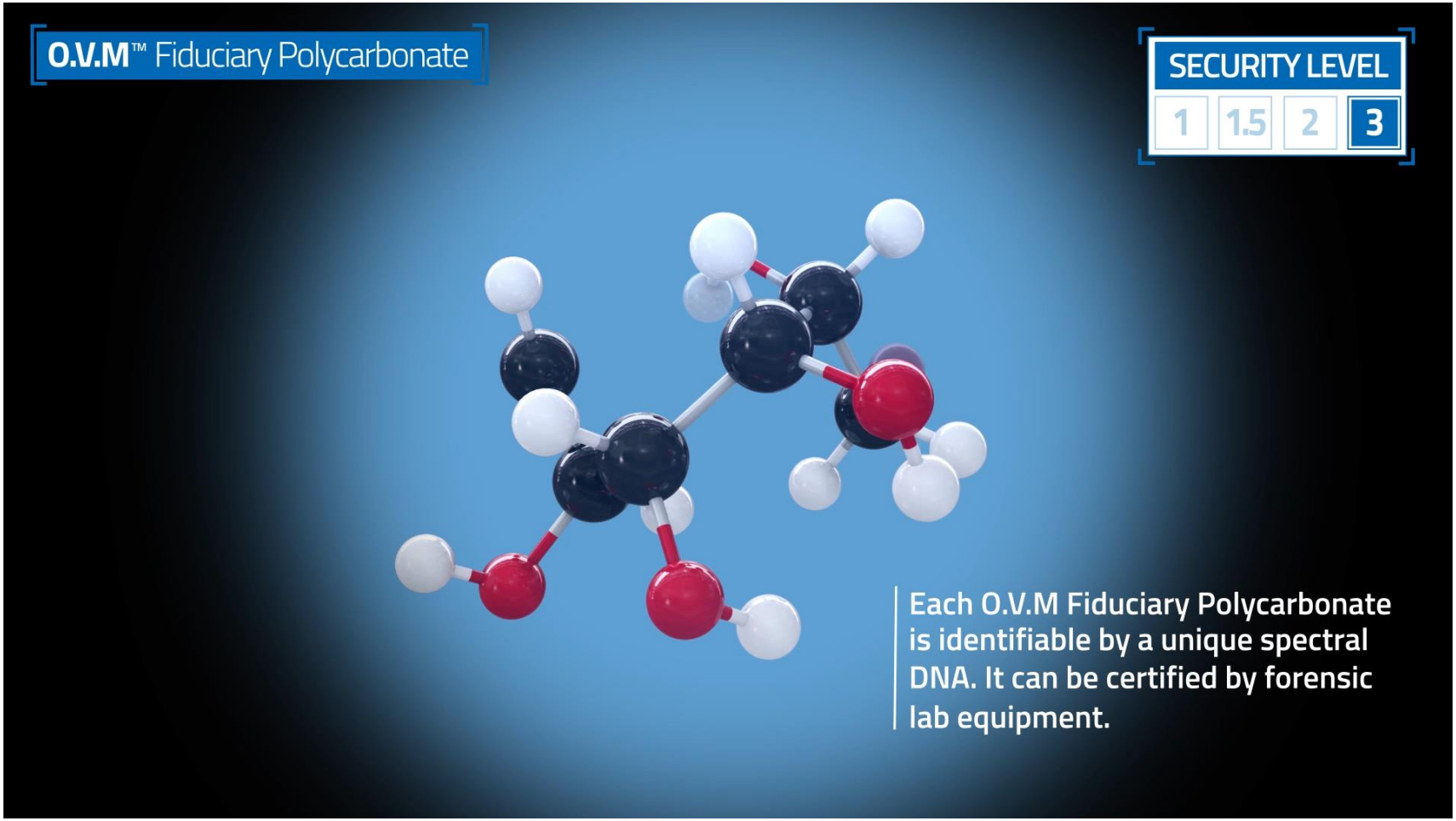
O.V.M™ Fiduciary Polycarbonate

## UV-Boost LEVEL 2


The transparent area secured with O.V.M
Fiduciary Polycarbonate shows a very strong fluorescence under UV light (365nm)

# O.V.M TECHNOLOGY




Level 3 is controlled with laboratory equipment. Each O.V.M polycarbonate is identifiable by a unique spectral DNA which can be certified using specific equipment. Verification is non-destructive.

# O.V.M TECHNOLOGY

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# O.V.M TECHNOLOGY

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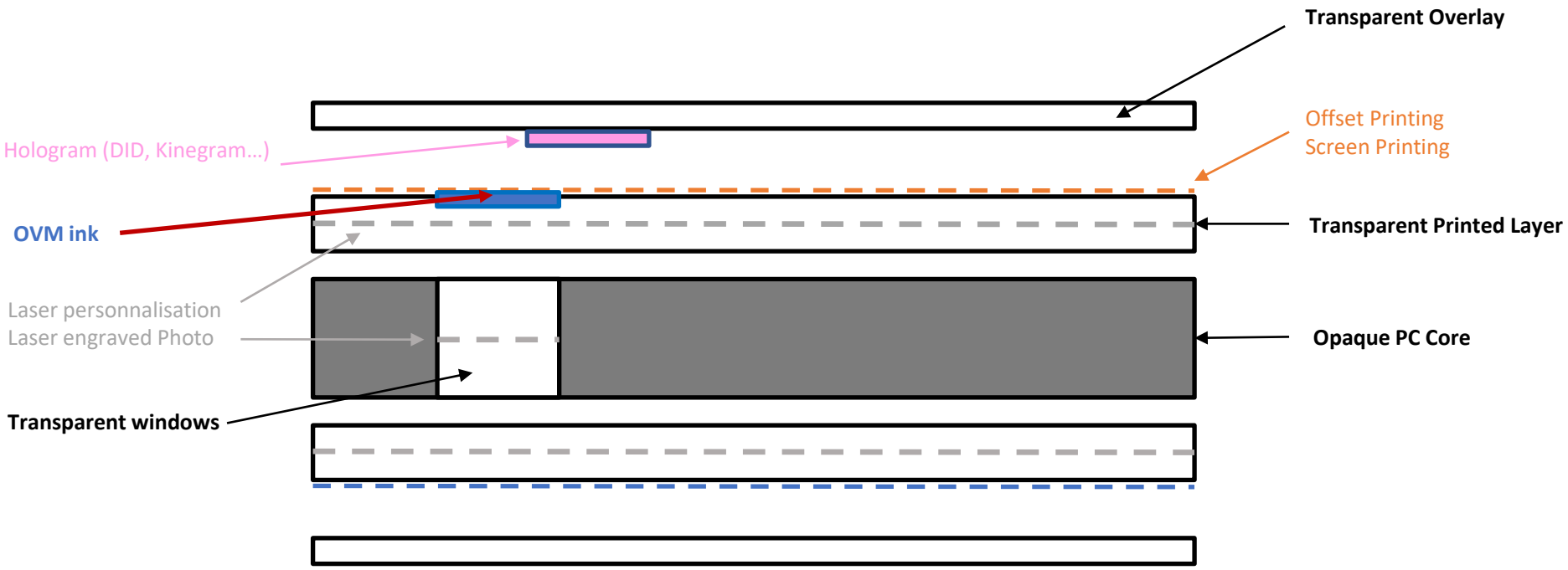
[O.V.M™ Fiduciary Inks]

***O.V.M™ Ink***
***Design flexibility***
***& High level of Security***

- ✓ **OVM Ink gets the same properties as OVM Polycarbonate**
- ✓ **Freedom of design into the clear window "Secured by-design"**
- ✓ **It is a multi-level technology : 1 / 1+/ 2 / 3**
- ✓ **No additional equipment**
- ✓ **Process already mastered by security industrial**

# Card structure

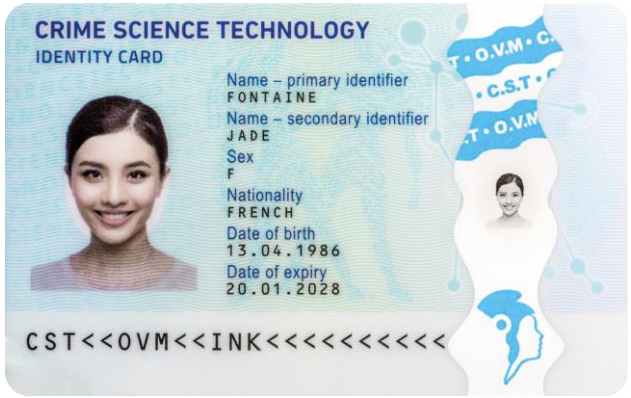
- ✓ Light toughness
- ✓ Delamination resilient
- ✓ Core card security feature



# O.V.M TECHNOLOGY

O.V.M™ Fiduciary Inks

## ColorShift LEVEL 1




O.V.M Fiduciary Inks offer a very innovative and intuitive visual effect: the pattern printed on the transparent area of the ID document changes color according to the color of the background on which it is displayed. For example, the printed pattern appears Blue when viewed on a light background; it turns Green on a dark background.

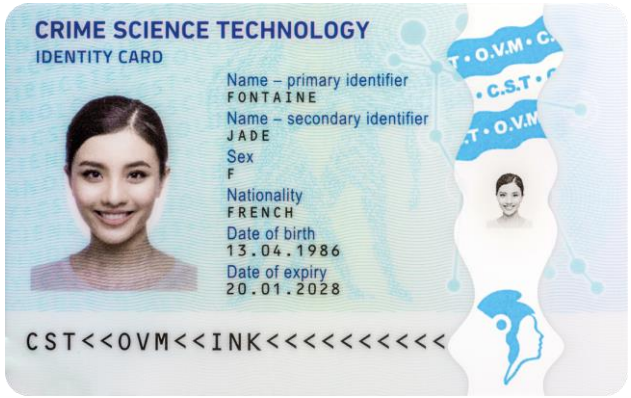
# O.V.M TECHNOLOGY

O.V.M™ Fiduciary Inks

## SmartShadow

LEVEL 1+

WITH A SMARTPHONE FLASHLIGHT





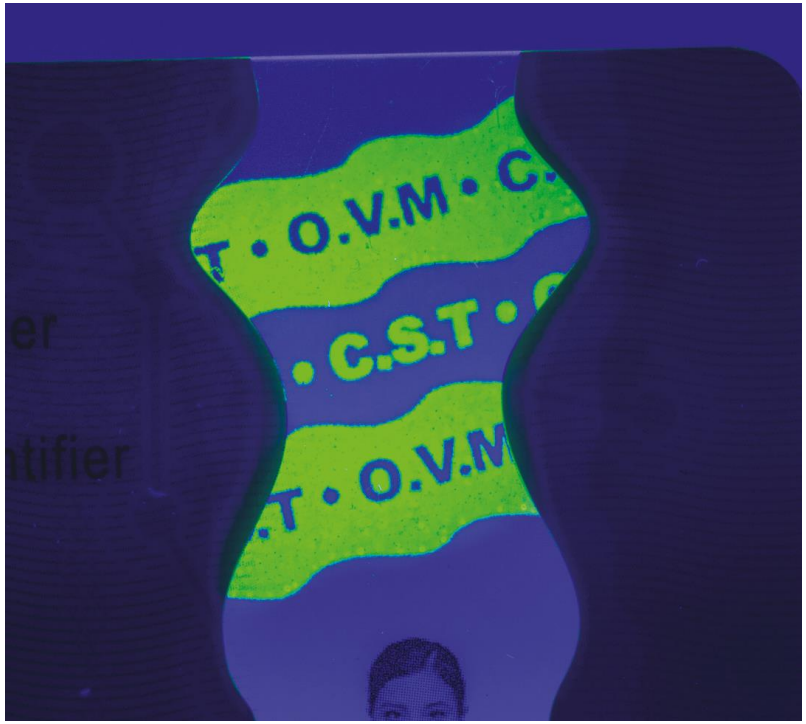
It is a new level of verification between level 1 and level 2, observable thanks merely to equipment readily available to the general public: the flashlight of a smartphone (or any other conventional white light source). For example, the transparent area turns Green while its projected shadow remains Blue.

# O.V.M TECHNOLOGY

O.V.M™ Fiduciary Inks

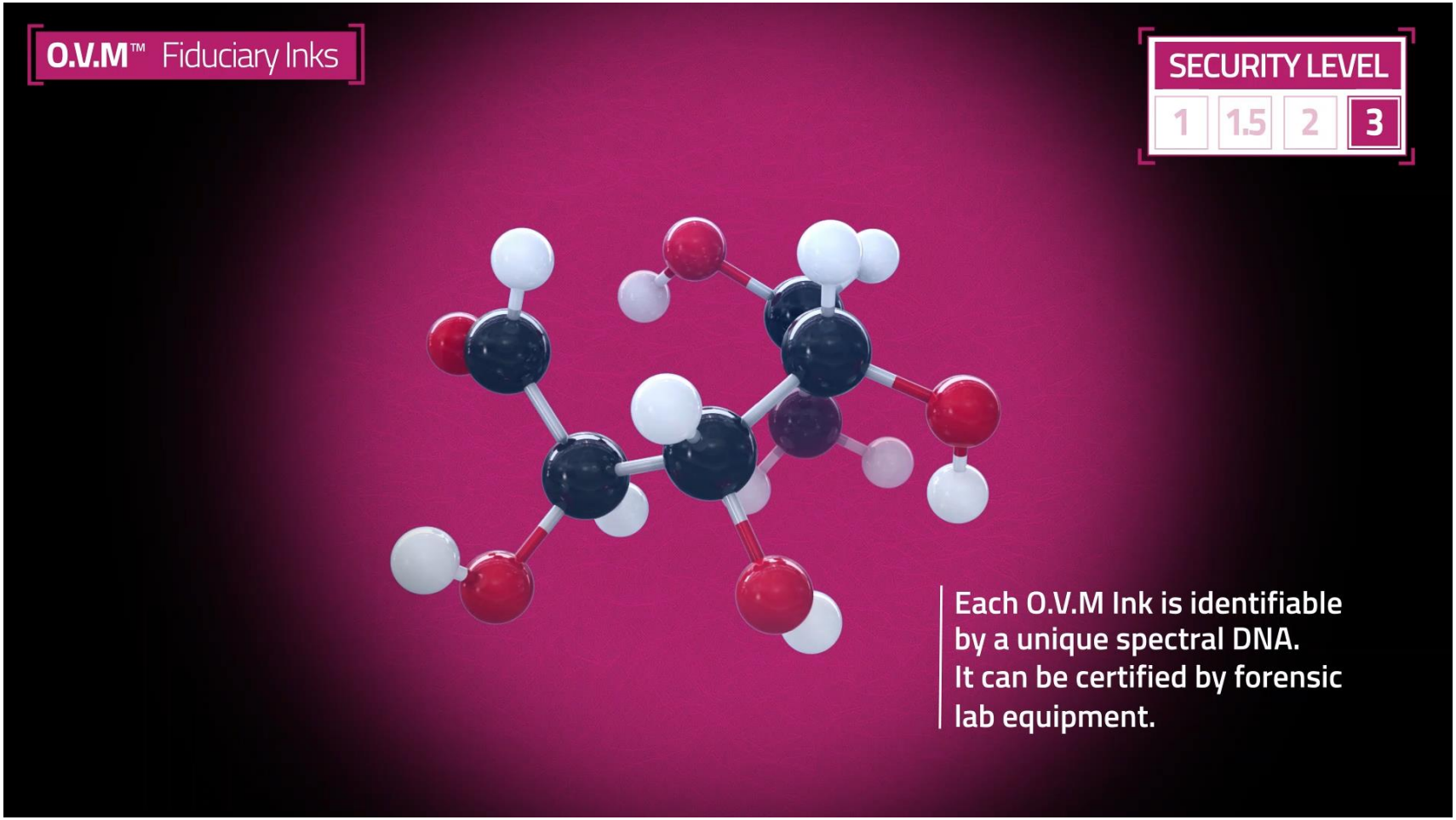
## UV-Boost

LEVEL 2




The transparent area secured with O.V.M
Fiduciary Inks shows a very strong fluorescence under UV light

# O.V.M TECHNOLOGY




Level 3 is controlled with laboratory equipment. Each O.V.M Inks is identifiable by a unique spectral DNA which can be certified using specific equipment. Verification is non-destructive.

# O.V.M TECHNOLOGY

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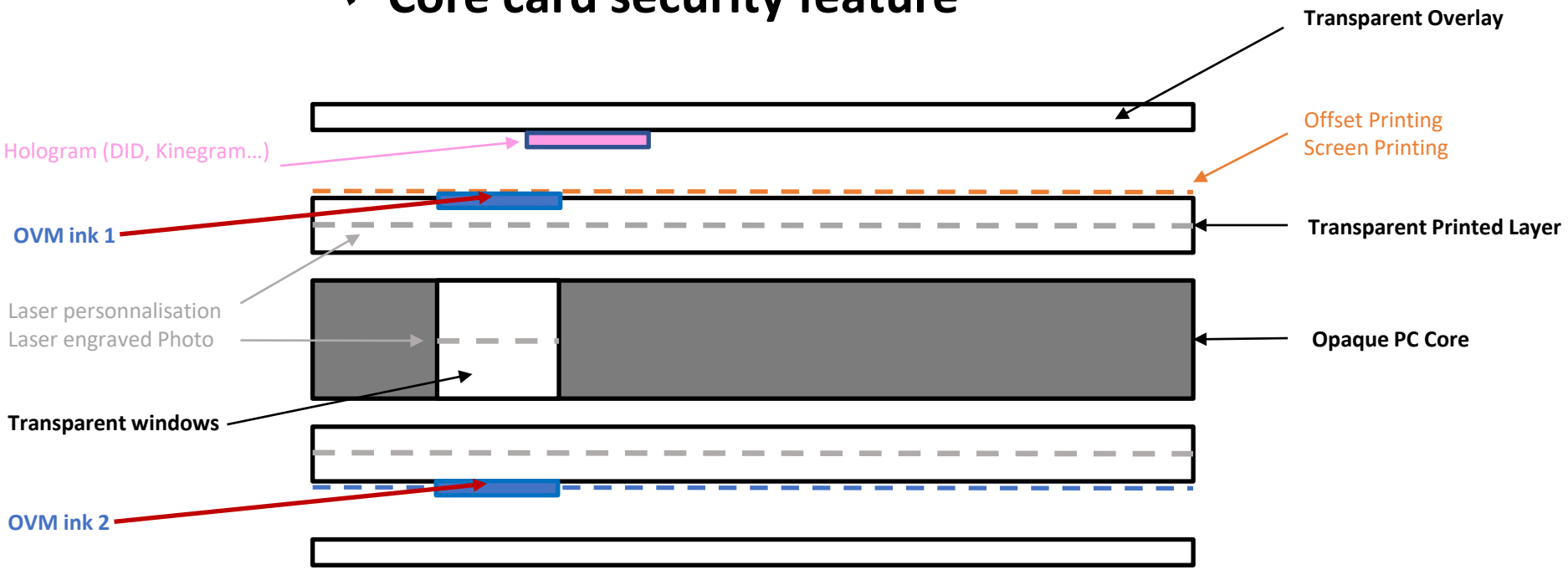
**O.V.M™**
Dynamic
Shifting Image

# Card structure

- ✓ 2 OVM Inks combined
- ✓ Light resistance
- ✓ Delamination resilient
- ✓ Core card security feature



# O.V.M TECHNOLOGY

O.V.M™
Dynamic
Shifting Image

## Colorshift
## + Design shift

LEVEL 1



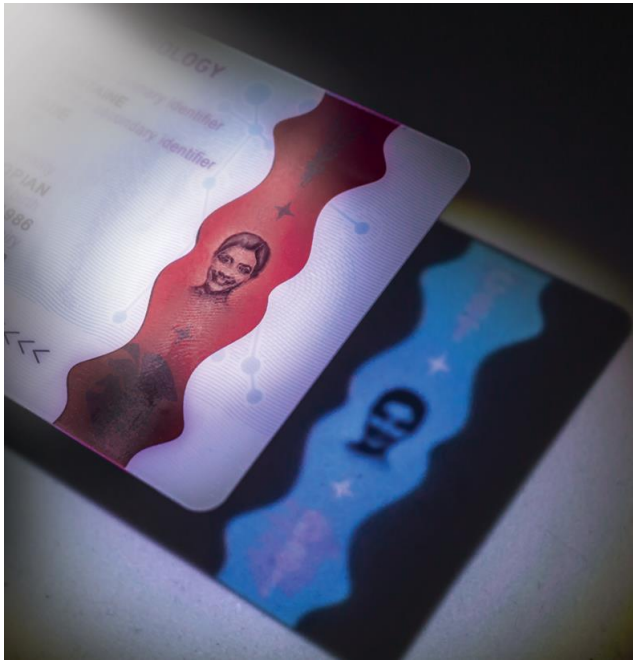
The O.V.M DSI design implemented on the transparent area of the ID document changes Color & Pattern according to the color of the background on which it is displayed It is an innovative security feature, highly intuitive and easy to remember.

# O.V.M TECHNOLOGY

O.V.M™
Dynamic
Shifting Image

## SmartShadow

LEVEL 1+
WITH A SMARTPHONE FLASHLIGHT

It is a new level of verification between level 1 and level 2, observable thanks merely to equipment readily available to the general public: the flashlight of a smartphone (or any other conventional white light source). For example, the transparent area turns Red while its projected shadow remains Blue.

# O.V.M TECHNOLOGY

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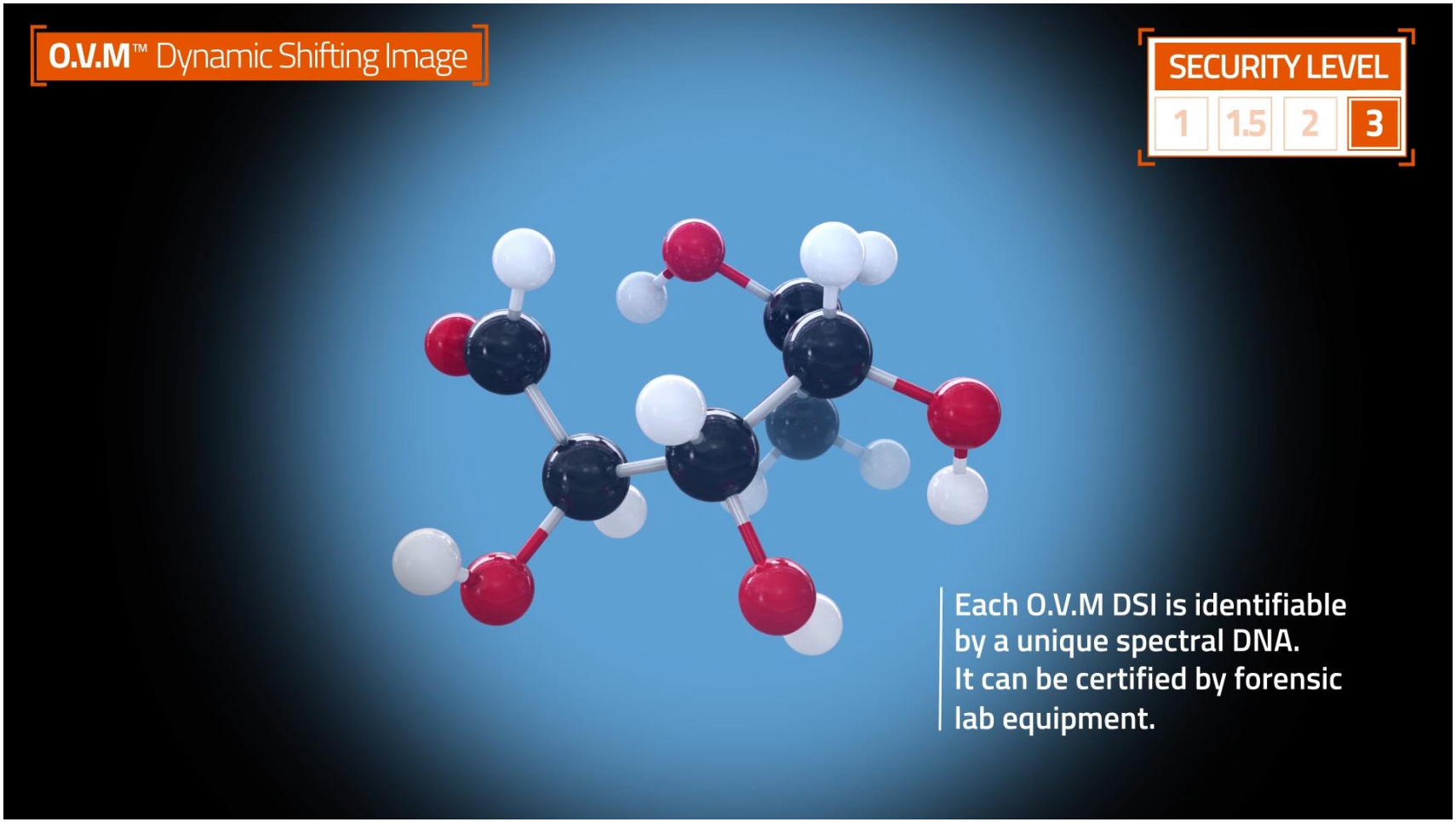
O.V.M™ Dynamic Shifting Image

## UV-Boost LEVEL 2


The transparent area secured with O.V.M
Dynamic Shifting Image show a very strong fluorescence combining a change of color and pattern under UV light (365nm)

# O.V.M TECHNOLOGY




Level 3 is controlled with laboratory equipment. Each O.V.M DSI is identifiable by a unique spectral DNA which can be certified using specific equipment. Verification is non-destructive.

# Take Away

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## O.V.M® Optical Variable Material

*the only agnostic solution to secure transparent area*

LEVEL 1

LEVEL 1+

WITH A SMARTPHONE FLASHLIGHT

**It allows an easy & intuitive eye control**
**Controlled by law enforcement in all conditions**
**It allows citizens to easily check the authenticity of ID-documents**

**Forgery**

**Fight against abrasion attacks on both sides**
**Securing the raw material of the document**
**Secured by-design**

**Counterfeiting**

**Integrated a new generation of OVD**
**Counterfeiting is complex : OVM combines several unique effects**
**Highly complex molecular engineering (not mastered by forgers)**

# Combination of OVM technology

# Combination with OVM


+

4PLATE
ADVANCED PLATE SOLUTIONS

- **Experts are unanimous : combining features is the key to reinforcing document security**
- **4Plate proprietary IDOptic and OVM technologies cooperate to form a new family of Optically Variable Devices**
- **Engraved laminate Plate and OVM together offer unprecedented possibilities**

# Combination with OVM

- **Dual Optically Variable Image Device (DOV-ID) :**
- **A new family of optical features at the highest level of security**
- **Protects entire card construction**
- **Provides three-level authentication**

# Combination with OVM


- **MLI / OVM / IDOptic 2-WAY:**
  - **Clear image switch upon tilt / rotate.**
  - **IDOptic indicia displayed by contrast between OVM fluorescent and complementary colours**
  - **Level 2 authentication in clear areas of window**
  - **Visual authentication in low light**

# Combination with OVM


- **MLI / OVM / IDOptic Contrast Switch :**
  - **IDOptic Contrast Switch + OVM**
  - **Constrast *and* colour Switch between image foreground and background upon tilt/rotate**
  - **Bright render**
  - **Can be matched with MLI flip (light direction dependent)**

# Combination with OVM

**The New DOV-ID can be implemented today**

**Works with all clear window shapes**

**Easily matched with pre-press graphics for enhanced anti-counterfeit security**

**Strong level 1 security feature with simultaneous image and color switch**

**Secured by-design**

**Robust feature pipeline including dynamic pump effects**

# OVM Technology recommendations

# OVM Polycarbonate and ICAO 9303

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### *A.5.1.4 Synthetic substrates*

Where the substrate used for the biographical data page (or inserted label) of a passport book or MRTD card is formed entirely of plastic or a variation of plastic, it is not usually possible to incorporate many of the security components described in 5.1.1 through 5.1.3. In such cases additional security properties shall be included, including additional security printed features, enhanced personalization techniques and the use of optically variable features over and above the recommendations contained in 5.2 to 5.5.2. States should preferably ensure that the plastic substrate is manufactured under controlled conditions and contains distinctive properties, e.g. controlled fluorescence, to differentiate it from standard financial card substrates.

*Basic features:*

- construction of the data page should be resistant to physical splitting into layers;
- UV dull substrate with a controlled response to UV, such that when illuminated by UV light it exhibits a fluorescence distinguishable in colour from the blue-white luminescence used in commonly available materials containing optical brighteners;
- appropriate measures should be used to incorporate the data page securely and durably into the machine readable travel document; and
- optically variable feature.

*Additional features*:

- windowed or transparent feature;
- tactile feature; and
- laser-perforated feature.

# OVM Inks and ICAO 9303

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### *A.5.2.2 Inks*

*Basic features:*

- UV fluorescent ink (visible or invisible) on the biographical data page and all visa pages; and
- reactive ink, where the substrate of the document pages or of a label is paper, at least for the biographical data page (if compatible with the personalization technique).

*Additional features:*

- ink with optically variable properties;
- metallic ink;
- penetrating numbering ink;
- metameric ink;
- infrared drop-out ink;
- infrared absorbent ink;
- phosphorescent ink;
- tagged ink; and
- invisible ink which fluoresces in different colours when exposed to different wave lengths.

# Recommended by International bodies

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ICAO

**September 2020 : selected for presentation to ICAO New Technology Working Group RFI**

**The 3 CST proposals have been selected :**

- ***O.V.M® Fiduciary Polycarbonate***
- ***O.V.M® Fiduciary Ink***
- ***D.S.I® Dynamic Shifting Image***

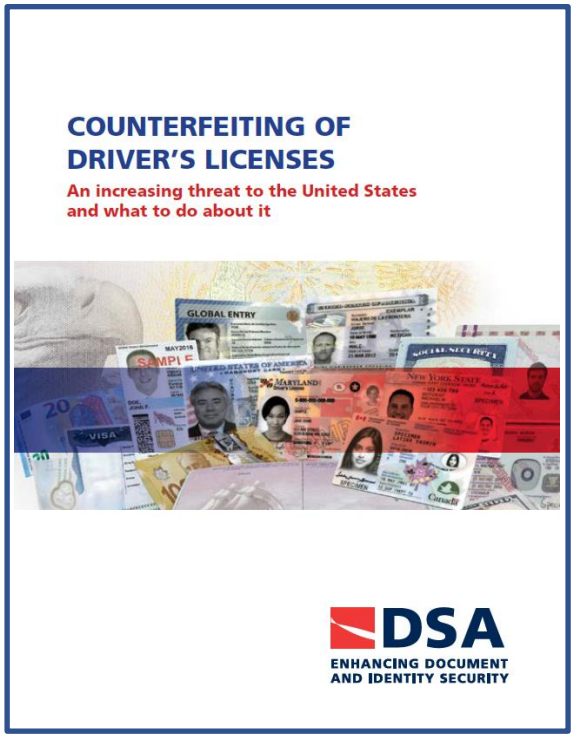
# Recommended by International bodies


**May 2021**
**Public version available on SIA website**
**Full version => contact Interpol 's counterfeit currency and security document branch [redacted])**

- ***Security polycarbonate => OVM PC***
- ***Transparent window with optical variable device => OVM inks or OVM PC***

**recommended to fight against counterfeiting and forgery of PC datage**

# Recommended by International bodies

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AND IDENTITY SECURITY

**September 2021**

**Advanced specifications for US DL :**

**Card body :**
***Polymer and color shifting substrate material***

**Card design:**
***Windows for see-through security features***

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