

## ICAO Recommended Security Features in Travel Documents

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# Presentation overview

- ✧ Gemalto in brief
- ✧ ICAO and Security of Machine Readable Travel Documents
- ✧ Synthetic substrates – Focus on polycarbonate
- ✧ Recommended security features
- ✧ From secure features to secure implementation
- ✧ Summary

# Gemalto in key figures

## Financials 2009

### ✧ Innovation

- 9 R&D sites worldwide
- 1,400 engineers
- Over 5000 patents

### ✧ Global footprint

- 17 production sites
- 30 personalization facilities
- 77 sales & marketing offices

### ✧ Experienced team

- 10,000 employees
- 90 nationalities
- 40 countries

- €1.654 billion revenue
- €171 million operating income

# Gemalto - Contributing to over 50 Government Programs

- ★ **Over 20 ePassport references including**

- ★ Denmark, Estonia, France, Italy, Morocco, Norway, Portugal, Singapore, Sweden, Turkey, USA

- ★ **Over 15 National eID references including**

- ★ Bahrain, Belgium, Finland, Lithuania, Hong Kong, Oman, Portugal, Qatar, Saudi Arabia, Sweden, UAE

- ★ **9 eHealthcare programs including**

- ★ Algeria, Azerbaijan, France, Gabon, Germany, Mexico, Slovenia

- ★ **31 personalization centers**

# Offering a flexible approach adapted to your needs

## Sealys

*Secure documents*

- Travel documents
- ID cards
- Healthcare cards



## Coesys

*Secure solutions*

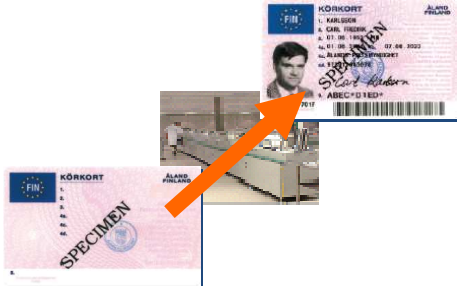
- Turn-key Identity solution
- Enrolment → Issuance → Application
- Local Professional Services



## Allynis

*Secure services*

- Fully personalized Secure Document
- Mass batch & individual personalization
- Managed Applications



# ICAO, Travel Documents, and Security



## ✧ ICAO: International Civil Aviation Organization created in 1947

- 188 contracting countries
- Promotes and ensures co - operation and interoperability between nations to ensure the development of civil aviation in a safe and orderly manner

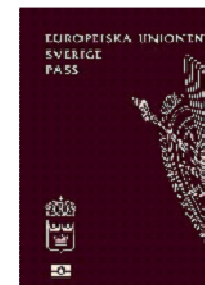
## ✧ ICAO Document 9303 = Standard for Machine-Readable Travel Documents

- Specifications for Machine Readable Travel Documents, Visas and ID cards

## ✧ Specifies format, layout, characters, MRTD technologies that are to be used for official travel documents

## ✧ Plus:

**It recommends security measures to counter document fraud**



# Role of security features

## ✧ Security threats

- Complete reproduction, copying
- Reuse of parts of authentic documents
- Photo substitution & data alteration



## ✧ Security levels

- Level 1 – Overt visual/tactile features – Quick inspection **1**
- Level 2 – Simple equipment – Expert **2**
- Level 3 – Laboratory equipment – Forensic analysis **3**



## ✧ Individual security features

- How do they counter the threats?
- How easy is it to verify them?

# Synthetic datapage substrates

## Recommended features

### ✦ Basic features

- Optically dull
- Resist splitting
- Attachment
- Optically variable feature
  - Inks, Dovids, CLI, ...



Surface relief (Gemalto)



### ✦ Recommended features

- Tactile
- Laser perforation
- Window
- + DOVID as recommended optically variable element

ImagePerf (IAI)



Sealys Window (Gemalto)



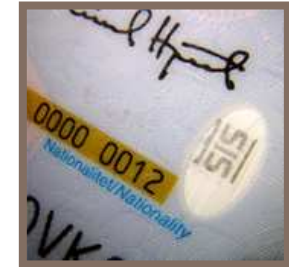
Kinegram zero.zero  
(OVD Kinegram)



# Focus on polycarbonate as the synthetic substrate

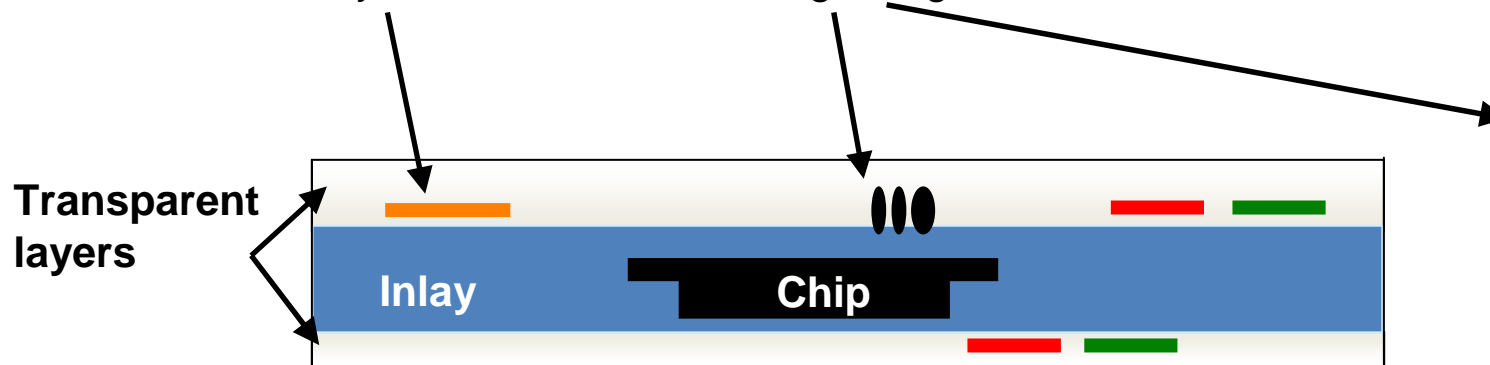
## ✧ Requirements fulfilled by polycarbonate documents

- Resistance against splitting
- Protection against complete reproduction
- Protection against photo substitution
- Protection against reuse of parts of authentic documents



## ✧ Provided that

- All layers made of polycarbonate, laminated together with heat and pressure
- Security elements and laser engraving inside the document



# Recommended: Tactile features

## ✧ Tactile elements

- Feature(s) can be verified with sight and touch (1st level)
- Positive, negative, lines, microtext, etc.
- CLI/MLI as a special optically variable case

Multiple Laser Image



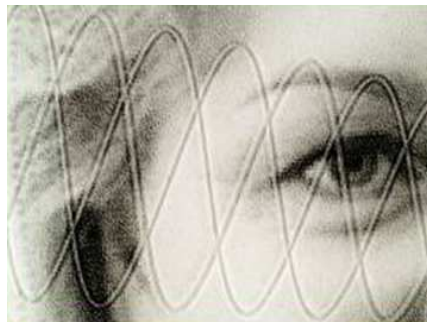
Tilting the document



## ✧ Role in brief:

- 3D nature cannot be copied
- Ensures that data is inside the surface
- Ensures that data has not been accessed through the surface
- Laser engraving through relief leaves characteristic pattern

Relief serves as a lens and deviates laser beam



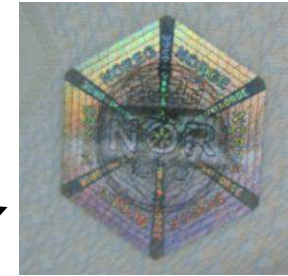
Continuous relief across portrait

# Recommended: DOVID

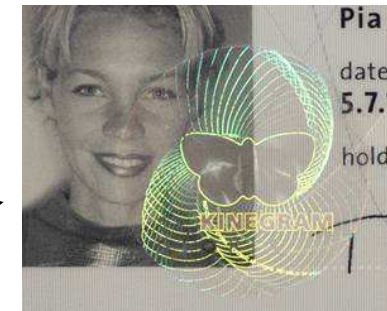
## ✧ DOVID - Diffractive Optically Variable Image Device

- Easy visual 1st line verification
- Transparent for laser engraving or metallic for easy verification
- High resolution diffractive surface with various visual effects

Metallic Kinegram  
(OVD Kinegram)



Transparent Kinegram  
(OVD Kinegram)



## ✧ Role in brief

- Optical variability cannot be copied
- Difficult to reproduce
- Data protection of (transparent embedded DOVID)

## ✧ Developments

- Metallic element to go with laser engraving
- Transparent and metallic elements in one

Combination Kinegram  
(OVD Kinegram)

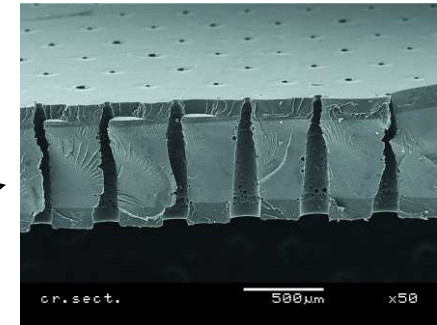


OVMesh (Optaglio)

# Recommended: Laser perforation

## ✧ Laser perforation

- Tiny holes through the document created with special laser
- Typically the holes form the document holder's photograph when looked at in back light (1st level)



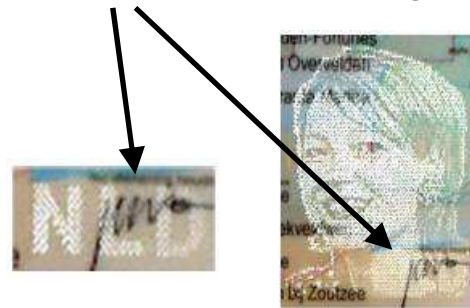
## ✧ Role in brief

- The physical holes cannot be copied
- Difficult to reproduce (specific laser technology)
- Protection of personal data (redundant info in perforation)



## ✧ Developments

- Tilted Laser Image with two different images



All pictures are of ImagePerf by IAI

## Recommended: Transparent feature

### ✧ Transparent element

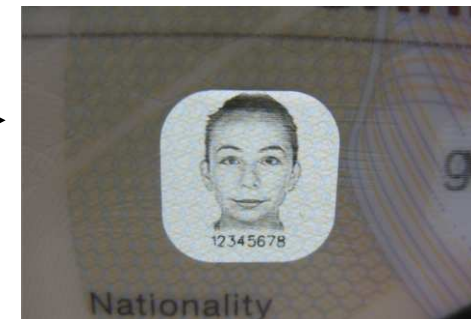
- Part of opaque core replaced with transparent material
- Ideally still 100% polycarbonate to resist splitting

### ✧ Role in brief

- Easy visual 1st line verification
- Transparency cannot be copied
- Further protection against splitting
- Protection of personal data if personalized

### ✧ Developments

- Combines well with other features such as printing, optical variability and personalization

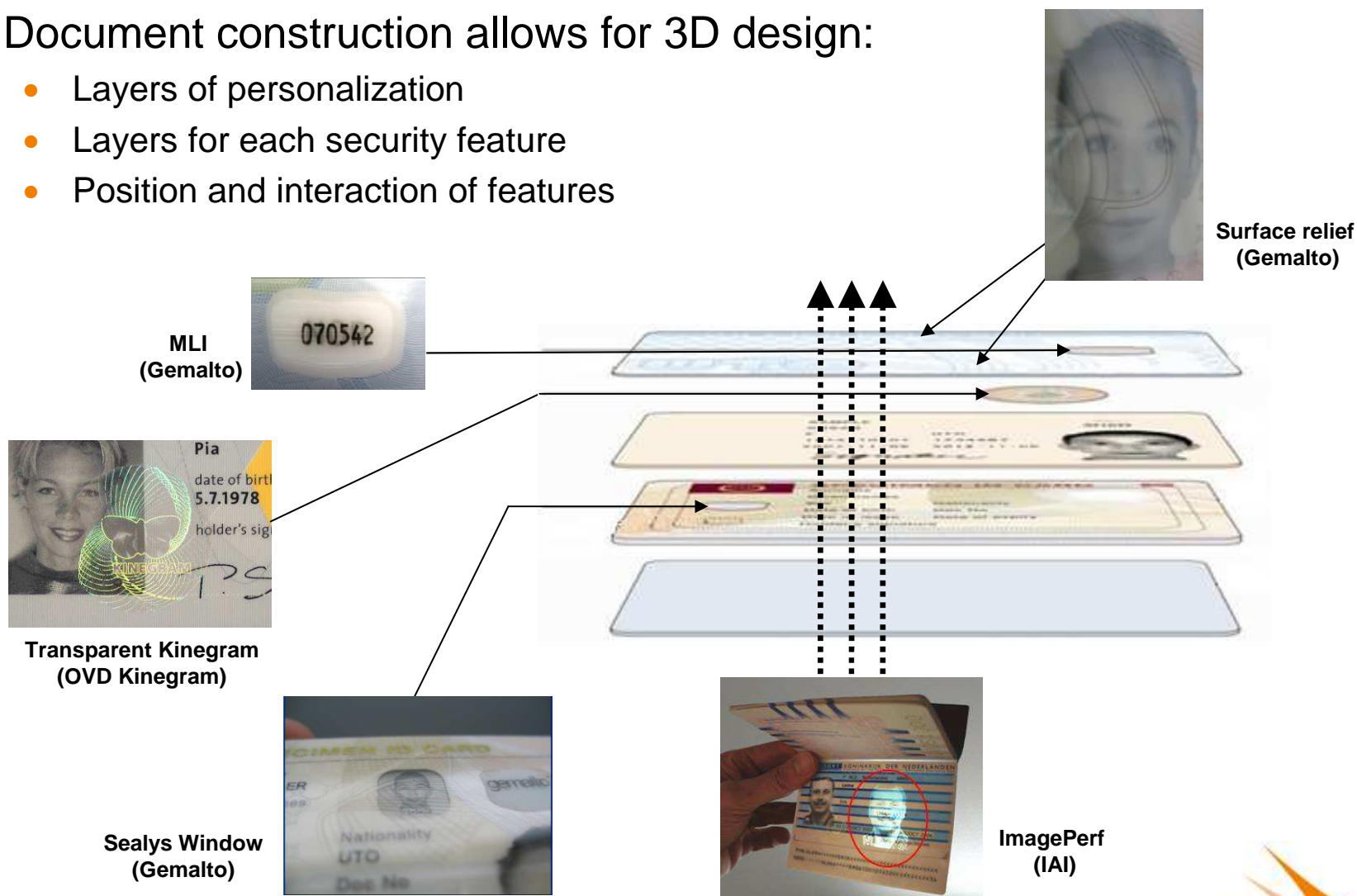


All pictures are of Sealys Window by Gemalto

# Secure implementation of security features

## ✧ Document construction allows for 3D design:

- Layers of personalization
- Layers for each security feature
- Position and interaction of features



## Summary:

### Advantages of the recommended features

#### ✧ Tactile features

- Cost efficient
- Combine well with other features
- A must for laser engraved polycarbonate

#### ✧ DOVIDs

- Number of effects from level 1 to level 3
- Continues to evolve

#### ✧ Laser perforation

- Adds another technology to the personalization phase

#### ✧ Window feature

- Links document's two sides
- Combines well with other features
- New and developing



**Thank you.**

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