Annex 22 A Moldova Citizen Passport Booklet

Booklet with polycarbonate electronic data page

February 2022

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COVID-19 - SHORTAGES

The COVID-19 pandemic has left businesses struggling with global supply chain bottlenecks as well as production and logistic disruptions. The semiconductor industry and other key component suppliers are unable to satisfy increasing demand which is leading to widespread shortages and strong material price increases. As these events are evolving continuously, Buyer acknowledges that their impact on THALES' performance cannot reasonably be ascertained and fully taken into account as of the date of this offer/contract.

Accordingly, Buyer agrees that THALES shall have the right to revise the terms and conditions of this offer/contract (especially delivery schedules, shipping dates, lead times, volumes and/or prices) and/or to propose to Buyer alternative solutions to complete/supply the products and services to the extent necessary to mitigate the impact of such disruptions. Under no circumstances shall THALES be liable to Buyer for the delays in the performance of its obligations to the extent such failure or delay relates to these supply chain disruptions.

Furthermore, if the performance by THALES of all or part of its obligations under this offer/contract is rendered impossible or impracticable due to circumstances caused by COVID-19, such as, but not limited to, instructions, laws and regulations issued by the competent authorities of parties' country of registration and, if applicable, the competent authorities in other countries where the products and services shall be delivered/performed, the time for performance of such obligations shall be extended by such period as is necessary.

1. INTRODUCTION

Travel documents confirm the identity of a person and enable seamless and secure international travel. However, they are only as satisfactory as the identification-related systems behind their production, issuance, control and inspection.

The International Civil Aviation Organization (ICAO) is focusing its efforts on the weakest links of the traveler identification program, from the verification of a travel document application to the issuance process and the inspection systems. The Traveler Identification Program (TRIP) initiative is a framework for security and facilitation, which focuses on the following:

- Tracing, linkage and verification of identity against breeder documents to ensure genuiness of identity
- Design of standardized Machine Readable Travel Documents that comply with ICAO specifications
- Processes for document issuance by appropriate authorities to authorized holders; controls to prevent theft, tampering, loss
- Inspection systems and tools for efficient and secure reading and verification of Machine Readable Travel Documents
- Globally interoperable applications linking Machine Readable Travel Documents and holders to relevant data in the course of inspection operations

In the case of documents, ICAO requires that the level of security must be sufficient in order to detect forgery and, at the same time, make verification as easy as possible. Weak points are standard features that are nowadays too easy to copy and some high end features that require a special decoder to verify.

Thales offers a range of secure electronic components and documents fully compliant with ICAO specifications, with a strong set of visual security features that are both easy to verify and difficult to forge (such as see through registration and transparent window for polycarbonate).

When designing security documents, our goal is to design a product such that its authenticity can be indisputably trusted. This is achieved by: using technologies that make the passport exceptionally difficult to copy, forge or counterfeit; mixing several different technologies (optical, tactile); providing each technology at the highest achievable quality and level, and by using rare means and materials with limited availability.

We focus on protecting both the document and the citizen's data. Security is in the document design and manufacturing as well as in the personalization process. We know that security features work best when combined and integrated in the document. Therefore we aim to duplicate the same personalization elements (for example, the document holder's picture and document number) within security features at different security levels and using different techniques to reproduce all of them.

We have developed a proposal for Moldova, which achieves a very high level of security. It is truly state of the art in terms of Travel document design and the implementation of visual security features.

Thales Products shall be delivered in compliance with the Buyer's requirements which are detailed by the technical specifications of the present document. Any request of modification of the present technical specifications and any agreed detail with the Buyer, shall be analyzed in terms of technical, costs and time impacts, and Thales shall submit an offer to be agreed and included by amendment in the Contract.

1.1. Aim of this document

The present document aims to describe the Thales design counters threats to the security of the travel and identity documents.

The travel document embeds a chip, with a highly secure ICAO application, storing and protecting all biographical data, as well as biometric data such as photo and finger prints. The chip is a very strong security feature. In the event that a counterfeiter successfully manages to change the portrait and citizen information, the data in the chip cannot be accessed and altered. Any tampering attempt can be detected since the altered data will not compute correctly, as it has not been signed and authorized by the Issuing Authority. Additionally, simple biometric matching can be done in order to verify the document against the person presenting his/her finger prints.

ICAO makes no particular recommendation on chip location in the passport booklet. Some countries like to keep the chip and the PC datapage together for they feel it offers better security, while others think that it is better to separate the chip and the datapage.

It is interesting to note that 90% of countries with a polycarbonate data page choose to host the chip inside, with the remaining 10% choosing a chip-less polycarbonate data page with the chip in the cover. We believe that the eData page provides the most effective solution in terms of durability, protecting the chip from rough treatment as well as ensuring that the chip and the data page protect one another. Attacking the chip will lead to data page destruction while counterfeiting the data page's holder data (usually the picture) will be evident since it will no longer match the picture stored in the chip.

The proposed configuration for this project is therefore a booklet with a polycarbonate data page and the electronic component hosted in the data page.

This document will focus primarily on the physical security of the document, rather than protection of the logical data.

1.2. Abbreviations & Terms

ICAO	International Civil Aviation Organisation
TD	Travel Document
PC	Polycarbonate card
UV	Ultra Violet
OVI	Optically Variable Ink
DOVID	Diffractive Optically Variable Image Device
DID®	Diffractive Identification Device
CLI	Changeable Laser Image
MLI	Multiple Laser Image
MRZ	Machine readable zone
BAC	Basic Access Control
SAC	Supplemental Access Control,
PACE	Password Authenticated Connection Establishment
AQL	Acceptance Quality Limit

2. ESSENTIAL FEATURES FOR FIRST LINE OF DEFENSE AGAINST FRAUDERS

A polycarbonate booklet which meet ICAO requirements with the benefits of highly secure and easy to verify security features.

2.1 Thales Gemalto Essential Booklet Architecture

Gemalto Essential Booklet Architecture	
Description	34 page booklet with paper cover and polycarbonate data page with integrated chip | Size 88 ± 0.75mm x 125 ± 0.75mm, with data page thickness: 740 +/- 60 µm
Materials	Paper cover material with Buyer unique gold foil artwork | 60 % cotton, 40 % chemical wood pulp, 90gsm security paper with registered multi tone watermark, single color security fibres and reagents | Polycarbonate datapage with securely integrated UV VisiFab hinge successfully tested over 500'000 flexing cycles
Printing & Security Features	Paper: Rainbow printing with UV included, guilloches, intaglio, micro text and 3 additional colors, with 3 page design repeated across the visa pages
	Polycarbonate: Maximum 6 offset colors (visible, UV, IR, antistokes inks), rainbow printing with UV included, guilloches, anti-scan / anti-copy features, micro text with deliberate errors, CLI/MLI, OVI, High resolution DOVID, tactile features (positive embossing) and Taggant.
	True grayscale laser engraving for biographical data, primary and secondary portraits
	Tactile laser engraving & laser perforation
Secure Embedded Software	Thales Gemalto eTravel Essential 1.2, based on Thales Pegasus chip (multi-sourcing is proposed with eTravel Essential 1.3 on Infineon SLC36GDA280).
	Communication protocol conform to ISO/IEC 14443 (Type A Interface)
	Implements all ICAO&EU security mechanisms (Passive Authentication, Active Authentication, Basic Access Control, Supplemental Access Control, Extended Access Control)
Durability	Tested to fulfill or exceed international ISO/IEC 18745-1 standard including mechanical durability stress tests, environmental tests, chemical tests, in conformance with ISO 10373 standard & ICAO minimum durability tests

2.2 Thales Gemalto Essential Booklet Architecture – Visuals

Please find below an example of the possible implementation of security features on the basis of the Moldova electronic citizen passports.

2.2.1 Passport booklet

We offer a 32 visa pages passport booklet with an electronic polycarbonate data page.

Passport booklet is a TD3 size format.

Page numbering in the passport starts with character 3 from the first paper leaf.

The passport Booklet incorporates a contactless chip in a Polycarbonate Datapage.
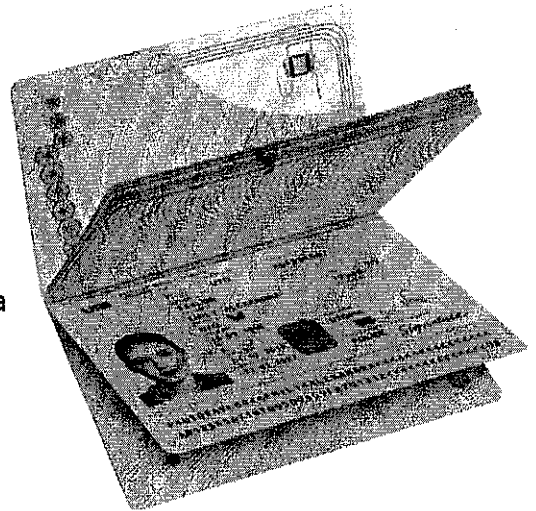
2.2.2 Passport Burgundy Cover

Paper based cover material has high crack resistance and wear resistance and as well high folding resistance.

Paper based cover material has been well adopted by the market e.g France, United Kingdom, Norway, Sweden, Finland, Thailand, Belgium, Netherlands, Spain, Portugal, Kenya, Denmark, Oman, Luxemburg.

Plastic coating and surface finishing enable various surface embossing patterns and various shades of matte / clear finish.

In order to comply with the tender planning we had to order in advance the Cover material. This synthetical cover material has been ordered with the following elements below:

Supplier : Neenah

Color : Burgundy (EU compliant)

2.2.3 End Paper
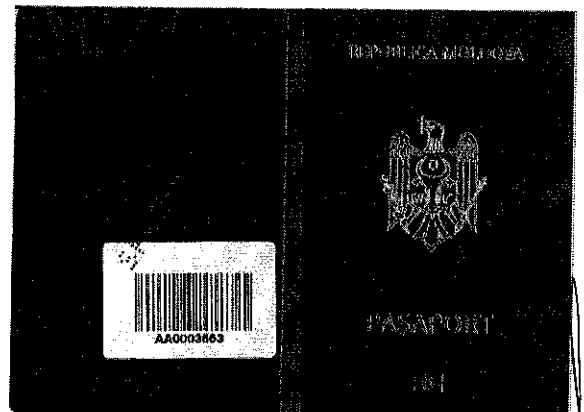
End paper material is ICAO compliant made of **60% cotton** and 40% chemical wood-pulp based security printing paper having a mass of 120 -150 g/m². Two colour security fibers can be mixed inside to add level of security:

Security paper used for inner pages and visa pages incorporates **two coloured security fibers** of two types of fibers yellow and red (Yellow being controllable in the visible area of the spectrum) having a relevant fluorescence when exposed to UV light.
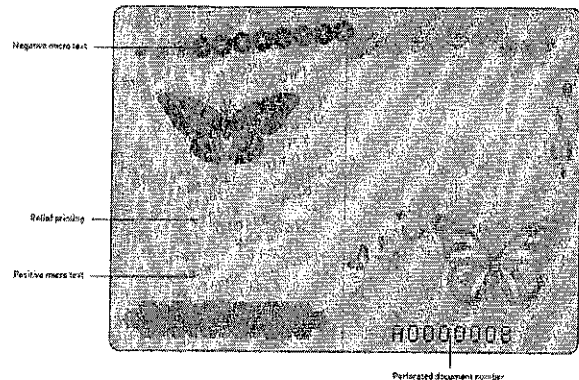
The paper has some chemical sensitizers mixed in, which react with the presence of chemicals and solvents that are used in forgeries. UV dull process is making any forgery visible as it will alter the UV reactiveness.
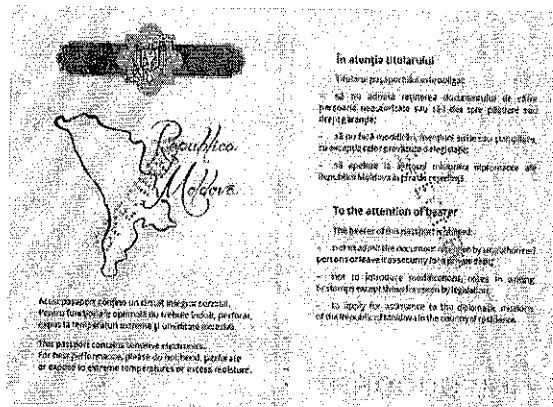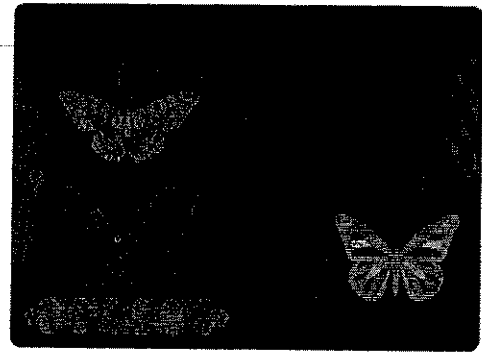
UV dull material is making any counterfeiting visible as the paper used usually does not have the specific UV dullness processing during manufacturing and will react brightly under UV.

Such paper with specific reagents and chemical processing is restricted to banknote and secure documents, which is an effective entry barrier for fraudsters.

See below a reference to the chemical sensitisation agents:

Chemical inclusion	Chemical reaction in paper
Bleach	Yellow/Orange
Sulphuric Acid	Pink
Sodium Hydroxide	Green
Ethanol	Blue/Gray
Cellosolve	Blue
Methanol	Blue
Acetone	Blue/Gray
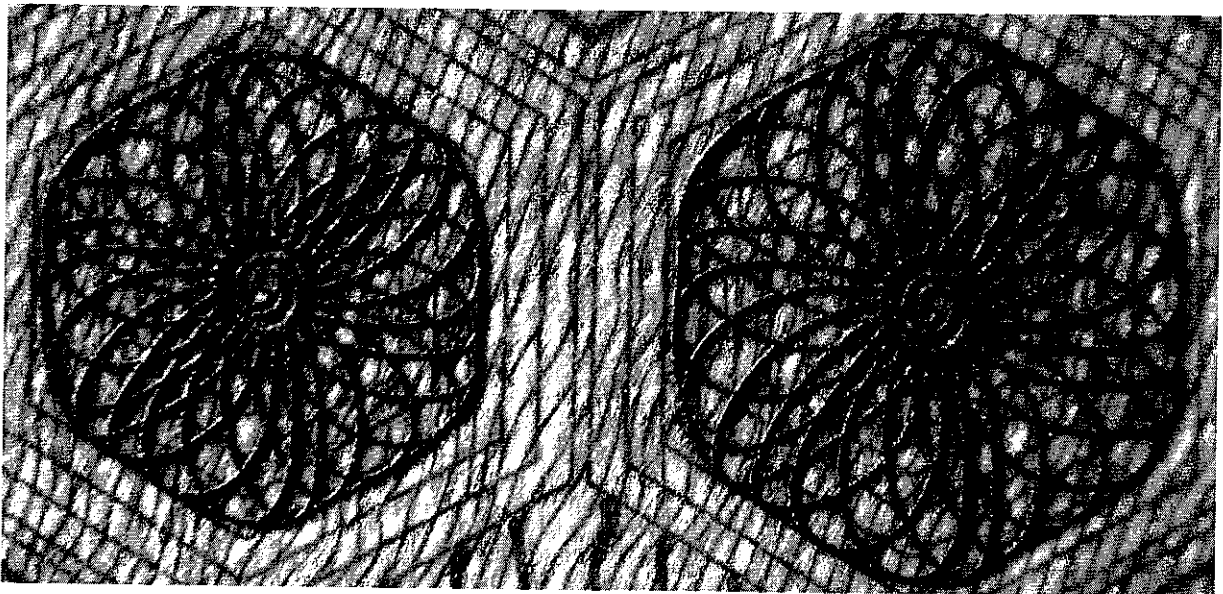
Intaglio printing is a special high-security printing technique for paper and is regularly used in passports, visa stickers, bank notes, etc. The end result is a positive surface relief pattern that can be verified with fingertips.

The security of intaglio printing relies on very limited access to the printing technology, the straight-forward verification of the existence of the intaglio printed elements with fingertips, and the extra features one can do with it, for example the latent image. Although it is one of the oldest security printing techniques, there is no way of mimicking well done intaglio printing.

2.2.4 Visa Pages

Visa pages material is made of 60% cotton and 40% chemical wood-pulp based security printing paper having a grammage of 90 g/m².

Genuine secure artwork done with security printing machines is giving the backbone protection for each page inside a passport.

Security printing and design brings in many security features and effects.
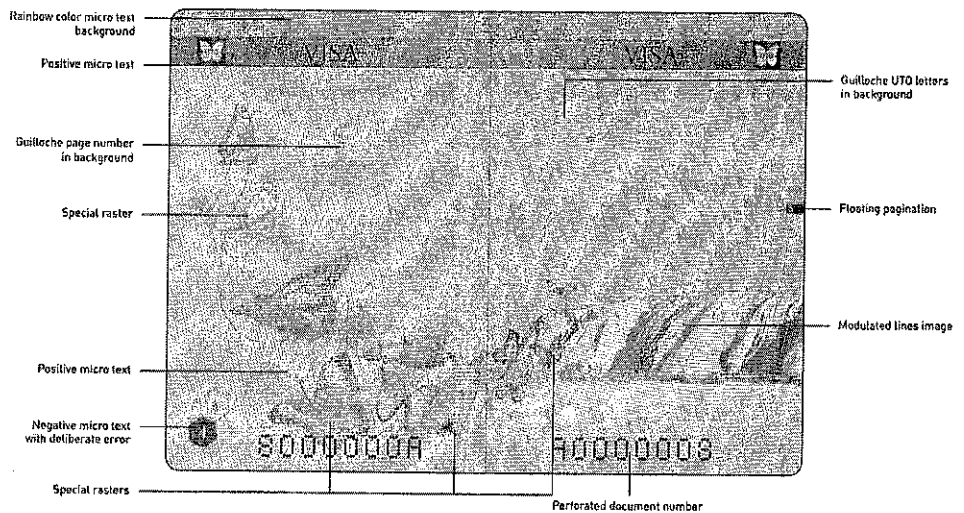
Technical details combined with artistic visualization together form a solid base for other security elements.

See through register is a combined design and technology feature. It can be manufacture only in a security printing process with very high accuracy registered printing on sheet front and reverse side. On the other hand see through register is a visual design element which has its own location in the page layout.

See through register is based on pattern A and B which are printed on separate sides of a passport page. When this area has backlight, it reveal the perfect register or A and B and the resulting pattern C when A and B overlap. Verificaion needs transmitted light.
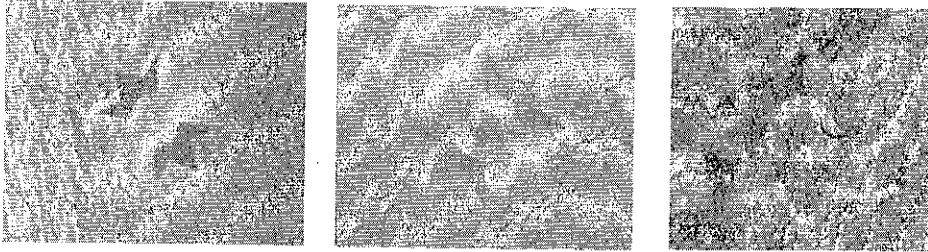
See through register illustration with pattern A on sheet front on left, pattern B on sheet reverse in the middle and pattern C in transmitted light on right.

See through register is an excellent copy protection security feature as it is extremely challenging to manufacture without the dedicated technology.

2.2.4.1   Visa Pages UV

UV inks are used in security printing to add another security layer and eliminate simple copy / scanning attacks

UV inks can be printed individually as invisible inks or they can be mixed with visible inks e.g. with the rainbow artwork and hence adding more complexity

UV inks are powerful tools for designer to make the design more interesting artistically and technically.

We propose 2 coloured security fibers Yellow and Red as already described above.
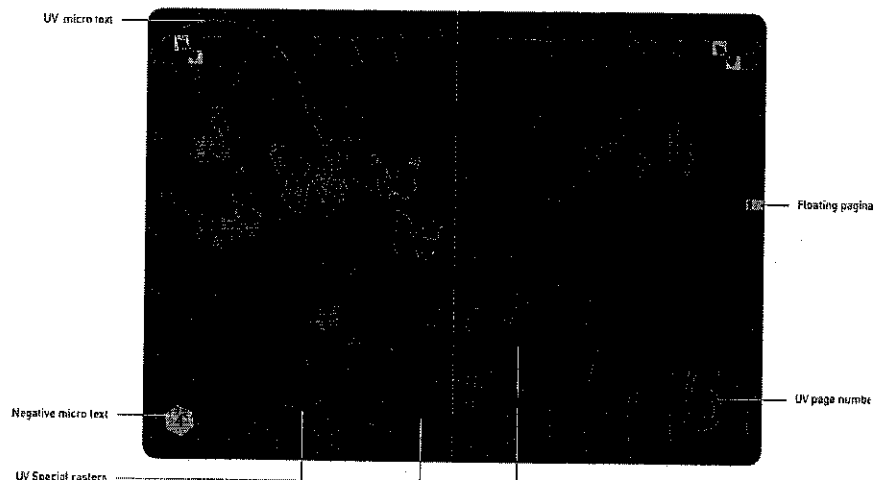
2.2.4.2 Multi tone Watermark

The security printing paper used in the passport inner pages is embedded with a figure or pattern that appears in greyscale tones when viewed through transmitted light. This feature, the watermark, results from the variation of the paper thickness within the structure of the paper during the paper manufacturing process.

Watermark is a part of the paper structure and hence almost impossible to copy without destroying the paper sheet with security printing on the surface. Watermark is extremely difficult to counterfeit and therefore protects well against forgery. Recommendation is to have an opening for security printing around the watermark area to help verification.

Multi tone watermark is the main watermark used in modern passports.

In order to comply with the tender planning we had to order in advance the watermark mould. Its design has been done in accordance with the tender specification.
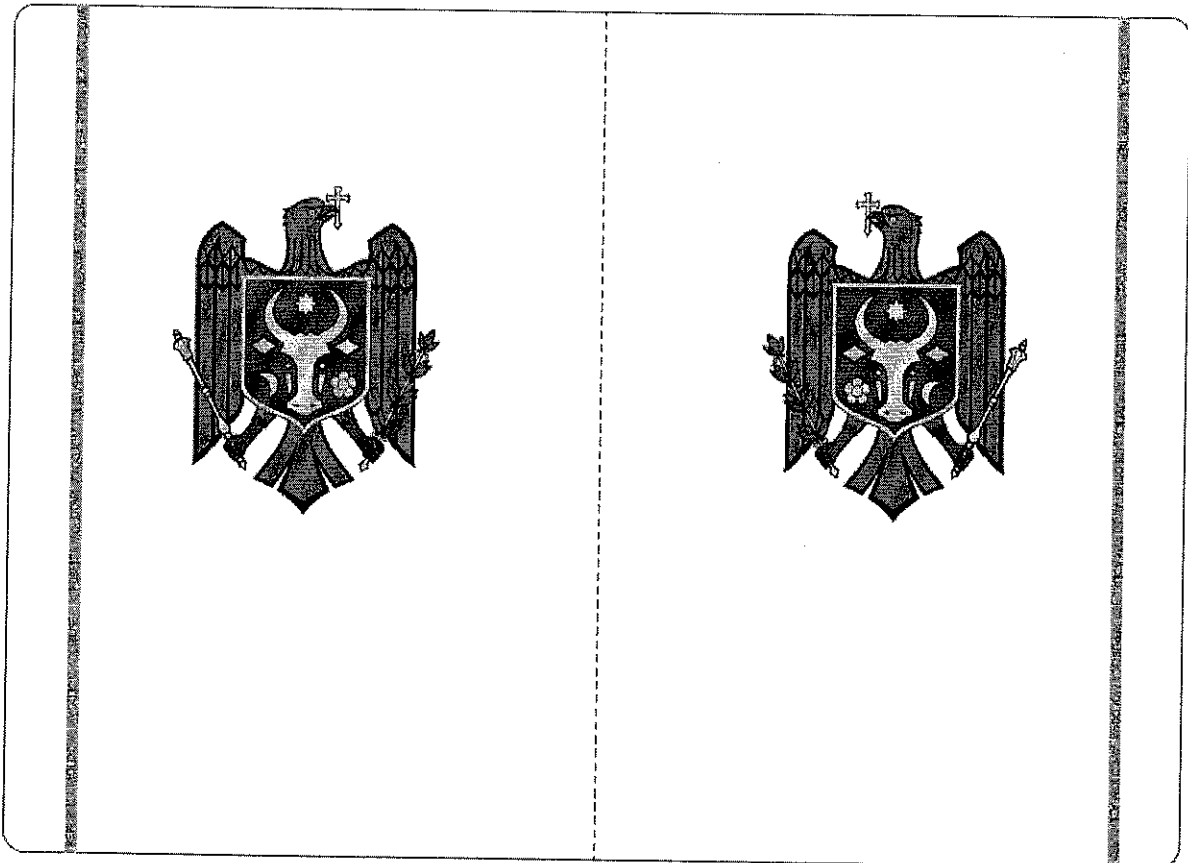
2.2.4.3   Advanced security thread

Security thread is often customized with national elements.

Security thread is easy to verify and provides an easy detection point.
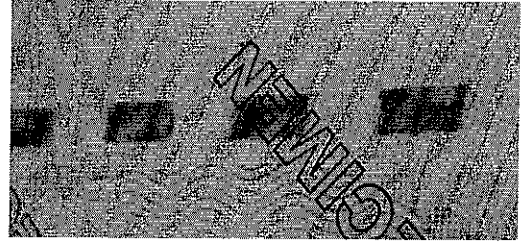
In order to comply with the tender planning we had to order in advance the security thread design. Its design phase has been done with the tender elements below:
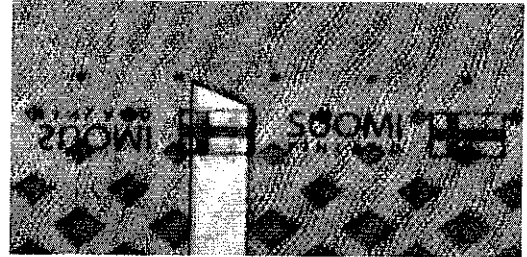
Security thread is embedded inside the paper material with

Microtext "REPUBLICA MOLDOVA" and UV fluorescence in yellow (on one side), **with a width of 1.5 mm.**

The security thread will be positioned parallel to the spine of the booklet and will have a tolerance range from 5mm to 15mm from the outer edge.

2.2.5 Passport letter press serial number

Passport serial number can be printed with letterpress process on the inner pages.

The passport serial number done by different techniques increase the security and provide copy protection.

Number printed with letterpress can be verified with fingertip.
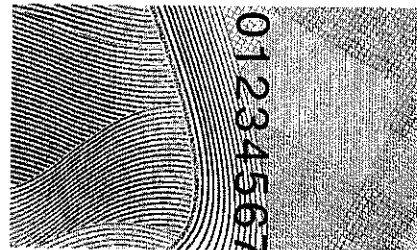
2.2.6 Laser perforation of the passport number

The passport serial number will be perforated on each passport with a laser beam. The number is composed of a set of small circular holes on each page of the passport (excl. passport cover and datapage).

The cross section profile of perforation across the passport is conical in order to avoid easy counterfeiting with a mechanical hole punching method. The hole size depends on the page number making it more difficult to swap pages.

The number is unique for each passport booklet. As the same number is also personalized in the datapage, it connects all pages together. As Level 1 feature, it prevents counterfeiting and forgery

The serial number of the passport can be laser perforated at the bottom-centered of pages 3 to 34. Thus the cover page won't be perforated fulfilling the tender requirement. **Nevertheless we strongly recommend to apply standard laser perforation through the cover in order to increase the security of the entire booklet and link the back cover to all the visa pages and its datapage.**
Back cover perforation provides more tampering evidence in case of dismantling attacks (delaminate the cover to access the stitching to change either data page or visa page). The perforation links both end paper and cover and any re assembly after the attack will leave visible marks

2.2.7 Moldova unique sewing thread

Thales use a special sewing thread with three piles twisted together for the stitching of the passport booklet. The thread will be customized to have an unique combination of **blue, yellow and red colors** to meet the national colors of the country. The thread are also made to become **visible under UV light.**

A special sewing thread makes the counterfeiting and forgery of the passport more difficult.
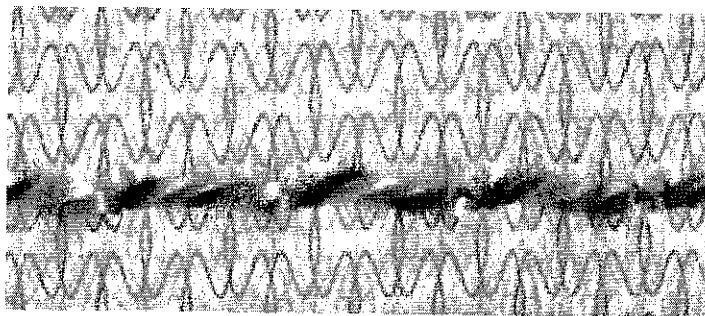
2.2.8 Sewing method

Thales offer the interlock stitch for the book binding, ensuring that any attempt to unbind the booklet will be tamper evident.

This sewing methods protect against counterfeiting. **Interlock stitch** is more difficult to open. In order to unbind the stitch, the counterfeiter needs to break the passport cover, thus destroying it.
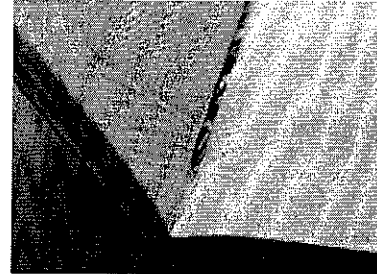
2.2.9 Polycarbonate Datapage

Polycarbonate (PC) is a unique material which is available in thin sheet format for Identity Document manufacturing. These thin sheets can be transparent or white and the product normally is a mixture of several layers of both options. The uniqueness is perfect adhesion of all the sheets without any adhesives during the lamination process. This is what position PC as the most secure material for polymer Identity products.

In addition to non-delamination, there are many unique security features that are only available for polycarbonate. These main features are described in this chapter.
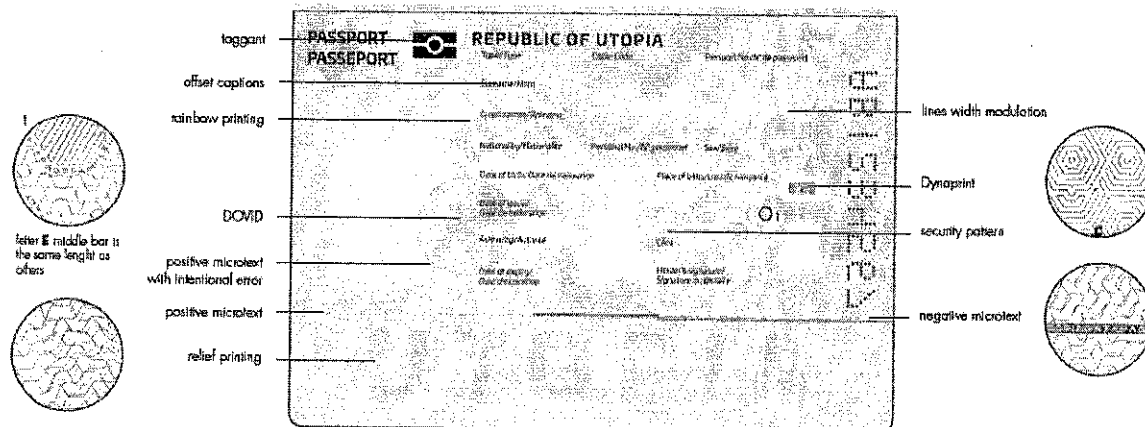
Protection of the antenna and the microcontroller against mechanical stress.

Embedding the microcontroller inside the polycarbonet data page structure.

Polycarbonate provides the best protection for the embedded software and the microcontroller with security features.

Thales Gemalto UV hinge connecting the data page with the booklet.

2.2.9.1   Datapage Layout

In order to comply with the tender planning we had to design in advance the datapage layout. Thales had to fix the technical layout in order to fit Thales standard contactless polycarbonate inlay. The design phase has be done according the ICAO requirements and with the tender elements received:

REPUBLICA MOLDOVA - *REPUBLIC OF MOLDOVA - RÉPUBLIQUE DE MOLDOVA*

PAȘAPORT
PASSPORT
PASSEPORT

Tipul/Type/*Type*
PA

Codul țării/*Country code/*
Code du pays
MDA

Nr. Pașaportului/*Passport No./*
Passport N°
AB0000000

Numele/*Surname/Nom*
XXXXXXXXXXXXXXXXXXXXXXXXXXXX30

Prenumele/*Given name(s)/Prénom(s)*
XXXXXXXXXXXXXXXXXXXXXXXXXXXX30

Cetățenia/*Nationality/Nationalité*
XXXXXXXXXXXXXXXX17

Data nașterii/*Date of birth/*
Date de naissance
XX XX XX10

Numărul de identificare/
Personal No./N° personnel
XXXXXXXXXXX13

Soxul/*Sex/*
Sexe
X

Locul nașterii/*Place of birth/Lieu de naissance*
XXXXXXXXXXXXXXXXXXXXXXXXXX27

Data emiterii/*Date of issue/*
Date de délivrance
XX XX XX10

Autoritatea emitentă/*Authority/Autorité*
XXXXXXXXXXXXXXXXXXXXXXXX24

Data expirării/*Date of expiry/*
Date d'expiration
XX XX XX10

Semnătura titularului/*Holder's signature/Signature du titulaire*
Semnătura

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

2.2.9.2   Datapage UV

UV inks are used in security printing to add another security layer and eliminate simple copy / scanning attacks

UV inks can be printed individually as invisible inks or they can be mixed with visible inks e.g. with the rainbow artwork and hence adding more complexity

UV inks are powerful tools for designer to make the design more interesting artistically and technically
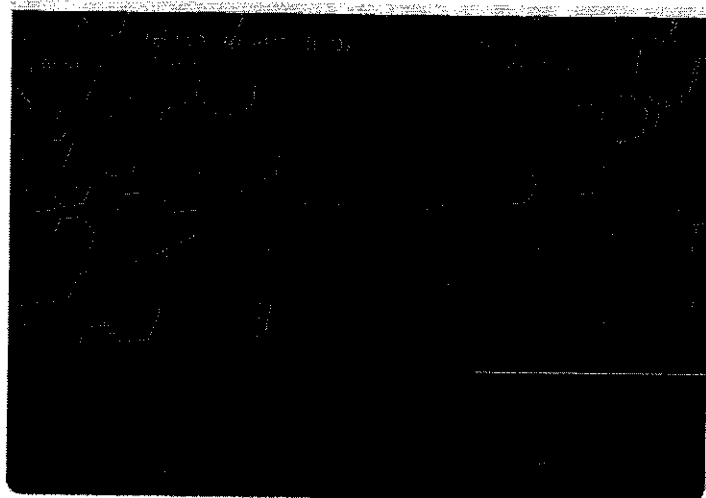
2.2.9.3 Datapage Embossing

Embossing as three-dimensional surface relief structure, provides protection against copying / scanning attacks.

Easy to use with touch and feel verification
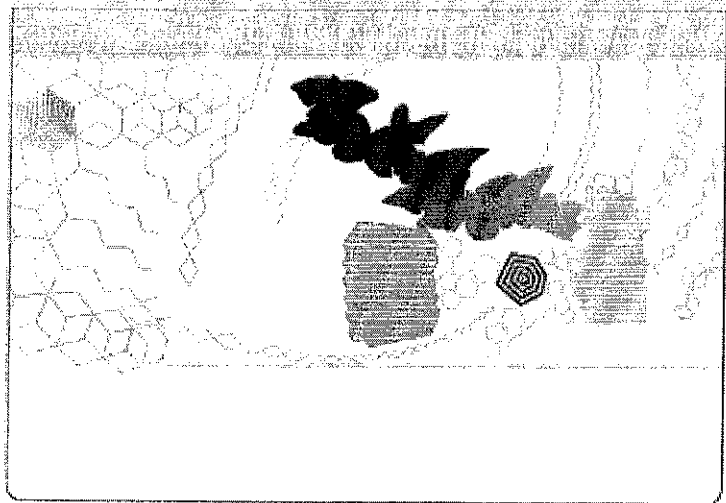
THALES

2.2.9.4 CLI / MLI

Changeable or multiple laser image (CLI/MLI) consists of personalization of typically two data under/through a lens on the ID document surface. The two sets of data are alternately visible when tilting the document.

Thales offers the next generation CLI/MLI that can be combined with surface embossing lines, micro-text or can even include a separate reflective element. It offers great flexibility in terms of desired shape, for example sharp edges, irregular shapes and bent / curved lens lines. Furthermore, it provides improved effect quality providing excellent switch between images.

CLI/MLI is a personalized and optically variable first line feature, very easy to verify. It combines the document structure and personal data. Feature and data in it cannot be copied, altered, or reproduced.

CLI/MLI is one of the few personalizable security features but as a simple stand-alone element, it is perceived to lose its strength and security purpose. Thales offers complex shapes with sharp edges while also integrating another element inside CLI/MLI, making it challenging to remake or replace. Thanks to Thales Gemalto Secure Surface, CLI/MLI can contain strong surface embossing. It raises the security of this powerful feature to the new level.

Difference in between CLI and MLI is that MLI verification is up-down movement and CLI verification is left-right movement respectively.
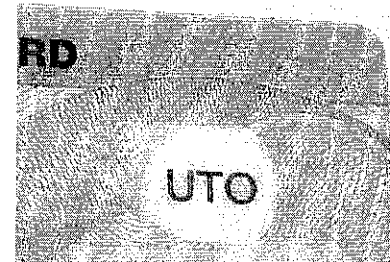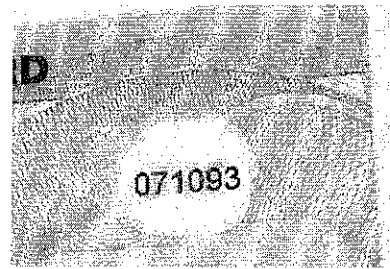
2.2.9.5 Optically Variable Ink (OVI)

OVI (Optically Variable Ink) printed image changes its color depending on the viewing angle. OVI colors are typically used to print a distinct element such as an emblem or a logo but they can also be used as a part of the background printing. Furthermore, the specific OVI inks –including their colors – used in national ID documents are only available to high security printers. The optically variable effect cannot be copied or scanned and is easy to verify without any tools. Although simulations have been seen, an in-depth investigation by experts would normally allow to identify forgeries performed with substitute inks or mix of inks. OVI is still regarded as an efficient security feature and an essential part of security design.

To increase the security of OVI, Thales recommends to use OVI mixed with micro particles, UV fluorescent or IR fluorescent inks.
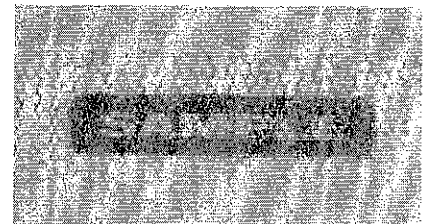
2.2.9.6 Diffractive Optically Variable Image Device (DOVID)

DOVID is a holographic element embedded inside a polycarbonate document. It can include lots of different features (from Level 1 to Level 3) and effects which can be verified by tilting or rotating the document and by using different magnifications (bare eyes, magnifier, microscope).

Transparent DOVIDs protect the laser engraved photograph against alteration or substitution.

In order to comply with the tender planning we had to order in advance the Dovid Origination. This Dovid design phase has been done with the following elements below:

- Transparent OPTOSEAL DID INLAY® for PC cards
- The DID gratings offer a resolution of 36 000 dpi, higher that the 24 000 dpi asked into the tender specifications.
- DOVID Size is 13mm x 13mm
- Elements which will be added into the bellow draft Dovid are : Guilloche, Moldova Coat of arm, microtext, nano text.

Please find below the design we drafted for Moldova:

scale 600%   scale 100%

2.2.9.7   Level 3 security features – Taggant

Level 3: secret security feature known only by limited number of trusted people. Taggant feature is a chemical marker, providing ultimate security for passport against copying and reproduction.

It is an invisible element that is printed on a secret location in the booklet.Verification is possible only with a special reader tool in Thales or customer forensic laboratory.

Buyer benefits are easy implementation, impossibility to counterfeit.

2.2.10 Durable and secure VisiFab UV hinge

Highly secure connection for data page with the booklet. Unique solution with extremely flexible woven fabric hinge.Secure integration into polycarbonate body offering highest fraud resistance with clear evidence visible after an attack

Qualified according ISO/IEC 18745-1: physical test methods for passport books. Mechanically robust binding element, successfully tested over 500'000 flexing cycles

Extremely user friendly. Granting full flexibility for the polycarbonate datapage regarding layout and integration of security elements. Integrated security elements protecting against datapage exchange by slicing the binding. Deployed in more than 80 million datapages worldwide

The hinge integrates UV reactive fibers and UV printing.
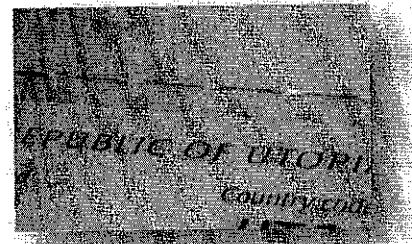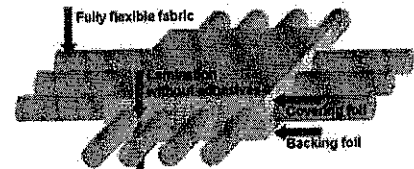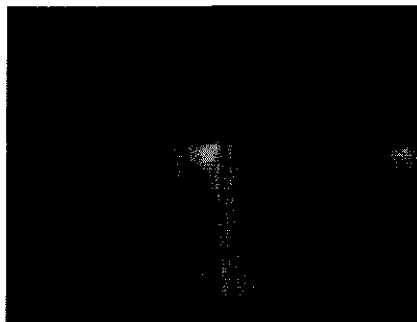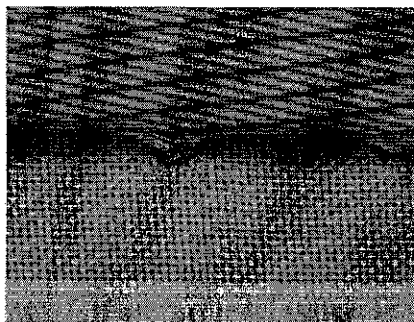
If the hinge were to be split from the page it would cause fatal damage to the page itself. Attempts to tear out the page deforms the hinge and it cannot be reformed once damaged which means that any attempt to manipulate or modify the hinge is readily identifiable and easily recognizable.
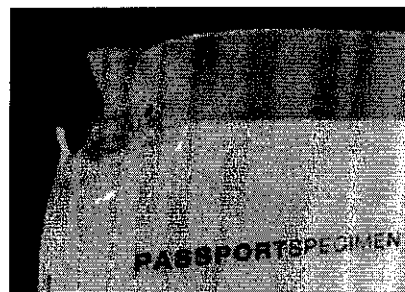
3. PASSPORT DELIVERY PLANNING

Here below is a description of an average passport delivery project with main milestones and amount of time needed. It does not go in details with the number of product versions or batch sizes. The table demonstrate how much time should be booked for each topic. Buyer approvals are missing, which often define the final project duration.

Task / Month	1	2	3	4	5	6	7	8	9	10	11	12
KOM	►											
Product and project specification	►											
Functional layout		►										
Conseptual design		►										
Security design				►	◆ Epson approval by customer							
Print proof					► ◆ Print proof approval by customer							
Paper		►			◆ Paper material delivery							
DOVID		►			◆ DOVID reel delivery							
Inlay		►		PO	◆ Inlay delivery							
PAT		►	◆									
SAT						►		◆				
Pilot manuf., delivery and approval						►			◆	Pilot approval by customer		
1st delivery										► ◆		
Official specimen delviery											◆	
GO LIVE												◆

A passport may have up to 70 features that come together to create a unique and secure document, from design to manufacturing.

Numerous materials, tools and processes are involved, such as:

Materials / tools	Process Steps
Cover material	Gold foil hot stamping
Gold foil	Cover embossing
Glue for cover	Cover gluing
Reinforcement tape	Cover drying
Security printing paper	Offset printing
Security fibres	Screen printing
Security thread	Intaglio printing
Intaglio ink	Sheet cutting
Offset ink	Sheet folding
UV ink	Sheet collation
Screen ink	Sewing
Sewing thread	Passport cutting / punching
Polycarbonate material	Passport Serial Number – encoding
DOVID	Passport Serial Number – letterpress
Lamination plates	Passport Serial Number laser – perforation
Printing plates for offset	Passport Serial Number – barcode
Printing plates for intaglio	Inlay manufacturing
Screen printing tools	Polycarbonate Window process
Data page laminator	Hinge process
Data page assembly	DOVID hot stamping
Cutting machine	Polycarbonate sheets collation
Booklet assembly	Polycarbonate Lamination
Booklet serial number	Sheet cutting
Design Software	Quality control

3.1 Elements to consider when building a delivery planning

> Material sourcing (cover, paper, DOVID, etc..)
> Manufacturing parameters setup
> Printing and lamination plates manufacturing
> Print test & color selection
> Pilot batch
> Testing & quality control
> Acceptance catalogue building
> First batch in volume

3.2 Approval Process

Design processes involve numerous approvals, with small approvals during the design phase and final approval on the first batch of samples. Those various sign-offs are directly affecting the global planning.

Some features must be agreed upon at early stage of the design process, due to specific lead times for sourcing from suppliers or because they take a large amount of time to create (origination and specific tool manufacturing):

> Paper specifications and originals it may contain such as watermark, security thread, security fibers) takes up to 4 months
> Cover (texture, color, embossing, UV printing) takes up to 5 months
> DOVID takes up to 3 months
> Polycarbonate hinge with custom printing and thread takes up to 4 months.

Features with shorter origination lead time will be agreed upon at later stages:

> Images, color tones, stitching thread (UV, specific stitching), texts

3.3 Planning for Success

Achieving a joint understanding of the key decision points is crucial as some of early decisions will be critical for the rest of the project.

It requires an active participation from appropriate stakeholders, in order to avoid changes at a later stage, which may not be possible without serious disturbances or delays to the program

Using dedicated tools and process to support the approval of intermediate parts of the future document without being able to see and feel the final product

> Computer simulations, printouts, samples, demonstrators and mock-ups to show how the product would look like and how some of the details/features function
> Remote color acceptance (launched during the COVID-19 pandemic)

3.4 How can we optimize the planning?

There is a tremendous amount of work on both Thales and Buyer sides to agree on the visual, design the various parts of the documents and get formal approval. An optimized planning relies on the resources allocated by the Government to get involved in the design and the availability of key people to approve the design:

- ➢ Identify right resources for the working group and it's quite often a cross-teams effort including staff from Passport Office and Forensics/ Document Fraud Units.
- ➢ Identify people who have proper approval authority (for the press proof in particular) and the validation chain (is the Government Cabinet involved in the decision?)
- ➢ You need to identity the visuals that you would like to use for the visa pages (and secure the copyright and original files to speed up the process)

In order to be in compliance with the very tight planning requested by the tender requirements, we already designed for Moldova the critical components that have the longest lead times (paper watermark, paper security thread, cover, datapage layout and DOVID).

This is possible because:

- ➢ The main technical choices are well defined in tender requirements (paper composition, cover texture and colour, DOVID effect)
- ➢ Watermark, thread, cover embossing and UV printing are level 2 features, which are not the most visible ones
- ➢ Our design team has a large experience in such design and quite often the initial design for those components get very few request for change from the Buyer.

By chosing our offer, you will be accepting Thales choice for the datapage layout, DOVID, covers, paper watermark and paper security thread, and this will allow you to receive pilot delivery on time at Contract signature +4 months.

THALES

Project timeline (Gantt chart)

Start — 17/02/2022

Months: Mar '22 | Apr '22 | May '22 | Jun '22 | Jul '22 | Aug '22 | Sep '22

- Thales Risk Order internally approved for Thread & Origination — 28/02/2022
- Paper Design Approval by Thales — 28/02/2022
- Graphical design — 08/03/2022 - 09/05/2022
- Thales Risk Order internally approved for DOVID Design + Origination — 08/03/2022
- DOVID and layout design approval by Thales — 01/04/2022
- Buyer Purchase Order Received at Thales — 06/04/2022
- **Contract award** Kick Off Meeting — 04/04/2022
- **White cards test keys** — 05/04/2022 - 02/05/2022
- **Key Ceremony** — 12/04/2022
- Buyer White card test keys (PAT) approval — 02/05/2022
- **SAT card** — 03/05/2022
- Buyer Security design approval – PDF — 09/05/2022
- **Print proof & approval on production site** — 10/05/2022 - 13/06/2022
- Buyer White card Live keys (SAT) approval — 16/05/2022
- **Pilot Prooduction** — 14/06/2022 - 26/07/2022
- **Delivery** — 27/07/2022
- Buyer Pilot Batch approval — 16/08/2022
- Pilot Shipment — 26/07/2022
- **Pilot Delivered** — 09/08/2022
- Personalization with final/ real perso solution at Buyer's side — 16/08/2022

Buyer's Milestones, Assumptions and Attention points

Before the award, Thales is designing and approving datapage layout, cover material and color, DOVID, paper watermark, paper security thread designs in order to accelerate the inlay, cover, DOVID and paper productions and as consequence the pilot batch production :

Thread & Origination is ordered by Thales on the February 28th the latest.

Paper Design is approved by Thales on the February 28th the latest.

DOVID design & Origination is ordered by Thales on the March 8th the latest.

DOVID and layout design is approved by Thales on the April 1st the latest.

Award & Kick Off Meeting date: April 4th 2022

Buyer Purchase Order for Volume must be received by April 6th 2022 the latest.

Buyer White cards with Test key approval (PAT) should come from the Buyer no later than May 2nd (time period for approval: 5 days).

Key ceremony and key custodian information: the exchange of live keys must start not later than one week after the Award & KOM date. Live key will be exchanged in 3 separated pieces and exchanged with 3 different key custodians with 3 different transport media. Thales would ask prompt replies and actions from the Buyer in order not to exceed 3 weeks duration of key ceremony process.

Only once the key ceremony is realized and live key safely exchanged, the SAT cards (white cards with live key) can be shipped on the May 9th.

Buyer White cards with Live key approval (SAT) should come from the Buyer no later than May 16th (time period for approval: 5 days) otherwise it would delay the inlay production for the pilot batch.

Thales is receiving datapage embossing and design & full booklet security design approvals on the dates on milestones, in order to accelerate the lamination plates production and as consequence the pilot batch production :

Buyer Full booklet design approval : May 9th 2022 (Security design is scheduled during 25 days ; time period for approval: 1 day)

The Print Proof & its approval will be happening Week 19 & 24 (May 10th to June 13th) in Vantaa Finland. 3 weeks are needed for Thales internal preparations. The inner page and visa pages have to be approved during 10 full days (**from May 31st to June 13th**) with the Buyer on site.

The pilot batch delivery is expected by August 9th – considering 2 weeks between transit (3 working days) and customs clearance in Moldova (7 working days). If customs clearance will be longer than 7 days – the pilot batch delivery will be late as we cannot forecast the customs clearance in Moldova.

Buyer Pilot Batch approval should come from the Buyer no later than Monday August 16th 2022 (time period for approval: 5 days) – This is the milestone to warrant that volume production starts no later than August 16th 2022.

The delivery planning requested by the Buyer being very tight, it is essential that the Buyer and Thales closely collaborate to validate and successfully conduct every milestone as detailed above.

4. ETRAVEL PRODUCTS

4.1 Procurement strategy to avoid supply disruption

The supply of chips from at least two suppliers ensures business continuity.

As part of the policy of excellence, THALES conducts a constant technological watch with suppliers on the market, through which quality and security assessments are carried out. This approach allows us to benefit from the latest technological advances but also to guarantee a diversified supply possibility.

THALES conducts a constant technology watch with our chip suppliers, through which we assess the security and performance of the latest generation chips.

Our eTravel Essential offer is kept available on at least two sources at all times..

Through this approach, we make sure to maintain our state-of-the-art security certifications on at least two suppliers on the market, but also guarantee continuity of supply.

The following matrix provides an overview of the different eTravel Essential products:

	eTravel Essential	
	1.2	1.3
Chip	Thales Pegasus	Infineon SLC36GDA280
OS Type	Native OS	
ICAO application	LDS 1.7/1.8 Doc 9303 8th Edition	

4.2 eTravel Essential 1.2

Thales eTravel Essential is a secure and reliable platform compliant with the latest ICAO and EU requirements, featuring Common Criteria certifications and advanced cryptographic algorithms.

We are offering the version 1.2 of eTravel Essential.

	eTravel Essential 1.2
Chip name and CC certification	THALES DIS DESIGN SERVICES Pegasus EAL6+ - September 2020
Technology	55nm/VHBR/32 bits CPU
Memory (NVM/RAM)	CONFIDENTIAL – ONLY ON DEMAND
Secure Embedded Software CC Certifications	BAC EAL4+, BAC and EAC EAL5+, PACE EAL5+, PACE and EAC EAL5+ - June 2021
PACE	Integrated, Generic and Chip Authentication Mapping DH 2048/ECDH 521
Active Authentication	RSA CRT 4096/ECDSA 521
Chip Authentication	DH 3072/ECDH 521
Terminal Authentication	RSA 4096/ ECDSA 521
Security Upgrade Management	Yes
Free NVM	72 and 91KB

4.3   eTravel Essential 1.3

Thales eTravel Essential is a secure and reliable platform compliant with the latest ICAO and EU requirements, featuring Common Criteria certifications and advanced cryptographic algorithms.

We are offering the version 1.3 of eTravel Essential as a second source component.

	eTravel Essential 1.3
Chip	Infineon SLC36 EAL6+ - December 2020
Technology	40nm/VHBR/32 bits ARM CPU
Memory (NVM/RAM)	280KB Flash/16KB RAM
Secure Embedded Software CC Certifications	BAC EAL4+, BAC and EAC EAL5+, PACE EAL5+, PACE and EAC EAL5+ - December 2021
PACE	Integrated, Generic and Chip Authentication Mapping DH 2048/ECDH 521
Active Authentication	RSA CRT 4096/ECDSA 521
Chip Authentication	DH 3072/ECDH 521
Terminal Authentication	RSA 4096/ ECDSA 521
Security Upgrade Management	Yes
Free NVM	72 and 80KB
Authentication protocol for Personalization	Proprietary and SCP03 (8 and 16bytes)
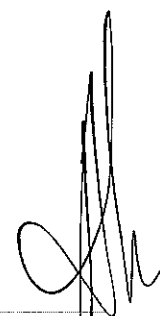
4.4   Additional description of the offered chip Thales Pegasus

Pegasus is Thales in house chip design for eTravel Essential 1.2 which brings several benefits:

*   Tailored-made product
*   Independence from silicon manufacturers
*   No compromise on security (Thales Invia Pegasus chip is EAL6+ certified)
*   Up to 1.7Mbps communication speed from the chip to the reader

Thales Invia has designed the Pegasus chip:

*   Invia was founded in April 2006 by a team of smart card experts
*   Wholly-owned subsidiary of the Gemalto group since 2013
*   Now part of Thales Digital Identity & Security since April 2019
*   50 security and PE experts located in the South of France
*   Analog, digital and software IPs intended to secure ICs
*   ASIC design & qualification in a CC certified environment
*   More than 2.0 billion secure ICs deployed in the field

4.5   Security level

Developed over a highly secure microcontroller, with Common Criteria certification, eTravel Essential offers the mandatory set of ICAO compliant security mechanisms, reaching the stringent security objectives of Government programs:

- Integrity of the data stored into the eMRTD
- Confidentiality of the data exchanges with the inspection systems (3DES/AES)
- Personalization features suiting various personalization processes and security levels
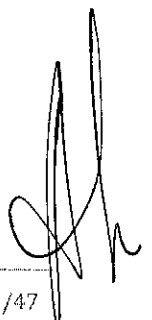
In addition, cryptographic low level layers (Cryptographic library) have been developed by Thales DIS Security Laboratory team. This team is composed of expert in applied cryptography and secure implementation, ensuring a unique track record of security evaluation as well as resistance to latest known attacks.

Product also includes multiple hardware and software countermeasures against various attacks:

- Side channel attacks (SPA, DPA, Timing attacks...)
- Invasive attacks
- Advanced fault attacks
- Other types of attacks

4.6   Readiness of Security Upgrade Management

As an extra additional feature, we offer Security Upgrade Management to provide the most robust embedded software to Moldova passport. This feature enables to reduce potential threats on installed base by patching the documents in the field through verification infrastructure (national border control, kiosks, mobile apps). Patching a cryptographic algorithm or adding a counter-measure to a newly discovered attack will then be possible for documents already in the hands of citizens, offering governments a precious alternative to a mass recall.

4.7 Interoperability

4.7.1 Field proven by citizens

The eTravel Essential is probably one of the most interoperable products in the world. Our products are field proven, with citizens from 28 countries traveling with their Thales ePassports having the eTravel Secure Embedded Software. In the last 6 years, we have delivered more than 170 Millions units of Thales eTravel Secure Embedded Software in the world. No issues have been reported to date by the customers who have used our products for the last decade.

4.7.2 ICAO Interoperability Test

The offered Thales eTravel Essential solution is interoperable with other solutions on the market and existing infrastructures in other countries.

Thales Embedded Software have been tested during all major interoperability test events since 2004.

The goal of these ICAO Interoperability sessions is to confirm that documents personalized from different Issuers can be read and verified on different Inspection Systems from the world.

At the latest ePassport conformity and interoperability tests at ICAO Interop session 2017 in Ispra, Italy in 2017, Thales eTravel Essential demonstrated its interopability.

The tests focused on the latest access control specifications, "Password Authenticated Connection Establishment with Chip Authentication Mapping" (PACE-CAM). It combines PACE and Chip Authentication (CA) into one protocol leading to faster ID document verification.

In addition, we always take the opportunity from those sessions to assess the performance of all participating chips.

Based on ICAO Interop session 2017 results we have created the following graph which ilustrates the speed, expressed in Kbytes per second, at which the secure embedded software processes the transaction with the inspection system.

- The highest throughput offers the fastest verification time.

- Thales product range of secure embedded software for ePassport achieved the fastest reading capabilities in those tests.

- Our product range performs the transaction 30% and even up to 50% faster than the average.

Communication Speed in Kbytes/sec

Data throughput rates up to 50% over the industry average

Average 11,1kB/s

THALES   Other vendors

Source: Thales
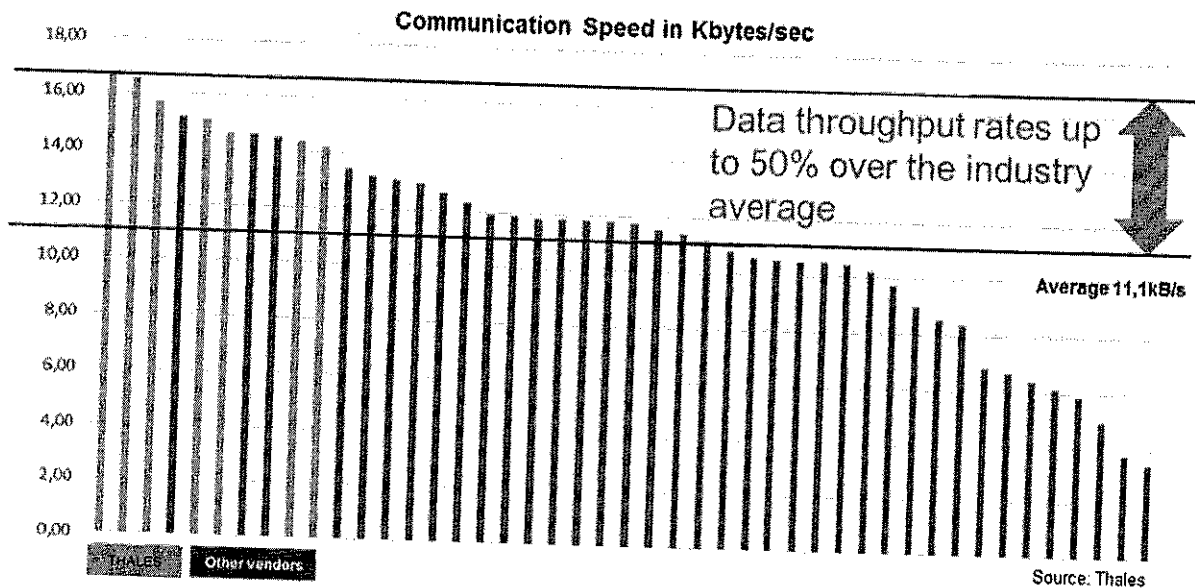
Speed is key because it increases personalization and quality control throughput. More importantly, faster reading of electronic and biometric passports at border control points is also critical consideration for authorities seeking to process millions of passengers as quickly and efficiently as possible, without compromising security.

5.   QUALITY AND ACCEPTANCE

5.1   Acceptance catalogue

The Acceptance catalogue defines method and criteria shared between the Buyer and Thales in order to check the quality of product deliveries.

It presents and explains the commitments of Thales regarding the guaranteed quality level at incoming inspection, in Buyer premises.

Acceptance catalogue consist of:

*   Defect classification (critical, major, minor), and types (functional, visual and dimension)
*   Acceptance quality limits (AQL)
*   Specification and Production limits (tolerances)
*   Colour limits
*   Inspection procedure
*   Reference samples

Acceptance catalogues are founded on long experience of Buyer requirements combined with Thales production capability and cost of yield loss.
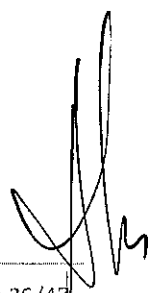
Thales will provide at the beginning of the project a "Generic acceptance catalogue" composed of Utopia sample to present Thales quality level.

Then definitive Buyer Acceptance catalogue will be initiated by Thales with reference samples from the real pilot production. It will be then reviewed and approved with the Buyer to agree on the product quality.

The initial inspections of the pilot and the first volume delivery have to take place at the premises of Thales or Buyer in order for the Buyer to be able to conduct later inspections on its own.

Thales can accept Claims from the Buyer only if the inspection is conducted as agreed in the contract.

In case the Buyer would requests higher quality level, it would have to be agreed between both parties in writing. The price would have to be adapted taking into account the impact on the production yield due to the modified product acceptance limits.

5.2 AQL

In conjunction with automated and online quality controls, all Thales products are inspected according to acceptance procedures based on AQL (Acceptable Quality Limit) and acceptance catalogue.

Inspections using AQL's offer a statistical cost-effective method to ensure that quality expectation are defined and met. AQL inspections are performed on a representative sample of a production run, in accordance with statistical standards ISO 2859-1.

By respecting the AQL, Thales guarantees that all efforts are made to ensure that the real defect rate is consistently lower than the AQL.

Defect are classified as Critical , Major or Minor.

- Critical defects are the ones involving the functionality of the product or the Security Elements, AQL = 0.065 for funtional defect, AQL = 1 for dimensional defect
- Major defects are Visible Defects that do not affect the accomplishment of the function or prevent authentication of the document, AQL = 2.5
- Minor defects are barely Visible Defects that do not have any effect on the functionality and/or the security of the product, AQL = 10

5.3 Defect classification and criticality

The main categories of defects are:
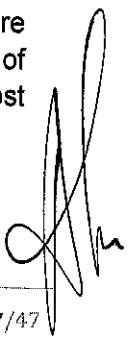
1. Functionality and durability
2. Dimensions
3. Visual deviations

Functionality and durability deviations are classified as Critical and Major.
Dimensions are classified as Major.
Visual Defects are classified as Major and minor.

Visual deviations are like scratches, extra points / lines and other visual elements that differ from the standard product. All visual deviations are not classified as defects. Visual deviations are rarely an obstacle to the functionality of the product. Deviations that hamper the appearance of security feature as such that they prevent confirmation of authenticity of the document are most critical.

5.3.1 Critical defects

Critical defects are the ones involving in the functionality of the product or the security elements.

a. Product functionality affected so that authenticity of the document is lost
   - Specified security feature missing (like UV fluorescent printing, micro-text, deliberate error, guilloche / fine lines, embossing, MLI, DOVID, window)
   - Datapage / visa page of booklet is not in right location or is missing
b. Chip functionality
c. Delamination
d. Sewing thread loosened to cause unravelling of stitching

5.3.2 Major defects

Major defect is a visible defect which partly impacts the appearance of a security feature but is not sufficient to prevent confirmation of authenticity of the document.

a. Product functionality
   - Security feature is present but there may be missing parts on its appearance, but the defect is not sufficient to prevent confirmation of authenticity of the document (like UV fluorescent printing, micro-text, deliberate error, guilloche / fine lines, embossing, MLI, DOVID).
   - Material and structure errors that prevent the visual personalization
b. Visual deviation on image area that is visible before personalization and can impact the quality of the personalized image
c. Product dimensions, security element positions

5.3.3 Minor defects

Minor are barely visible defects that do not have any effect on the functionality and/or the security of the product.

a. Visual impact on background area that is visible before personalization but does not impact the quality of personalization
b. Colour changing defects will not exceed the colour samples shown as upper and lower limits as per section 5.2 of this document (reference measuring limit ΔE LCh 5)
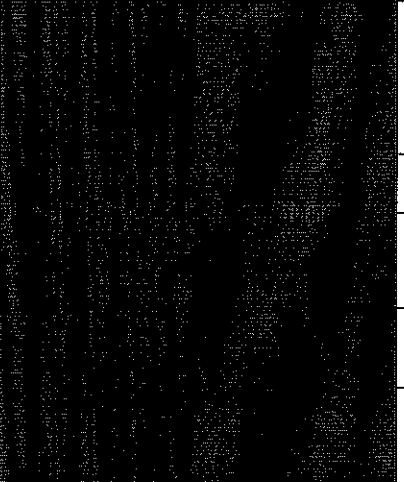
5.3.4 Inspection conditions

The inspection of the printing aspect is done visually. The below procedure allows detection of significant and disturbing defects on a product. Three main criteria shall be considered in the inspection.

1. Distance to product: at 40-50 cm.
2. Positioning of product: No special angle. Normal glance.
3. Inspection: During 3 s / product side

5.3.5 Table for examples of Visual defects

Major		
Location / area	**Type**	**Criteria**
DATAPAGE : Image area	Fluff / fibre	Length, Diameter of covered area to be commonly agreed
	Dot / spot / hole	Diameter to be commonly agreed
	Multiple dots	number, diameter to be commonly agreed
	Scratch	Width, Length to be commonly agreed

minor		
Location / area	**Type**	**Criteria**
	Fluff / fibre	Length, Diameter of covered area to be commonly agreed
	Dot / spot	Diameter to be commonly agreed
	Hole in background print or OVI	Diameter to be commonly agreed
	Multiple dots	number, diameter to be commonly agreed
	Scratch	Widthand Length to be commonly agreed
DATAPAGE: Surface of product	Optical spots	Diameter to be commonly agreed
Title page / Reverse side	Dot / spot / hole	Diameter to be commonly agreed
Cover	Hole in gold foil	Diameter to be commonly agreed
Paper pages	Dot, Dirt, Printing hole	Diameter to be commonly agreed
Data and Title page	Colour variation	Measure vs reference ΔE LCh >± 5

5.3.6 Dimensions

5.3.6.1 Booklet size

Passport dimensions based on ICAO 9303 Machine readable travel document, seventh edition, 2015 Part 4, Chapter 2.

Sampling method ISO 2859-1 Special Level 4 (S4) with AQL limits: AQL for dimensions: Major = 1.0

PASSPORT

125

88
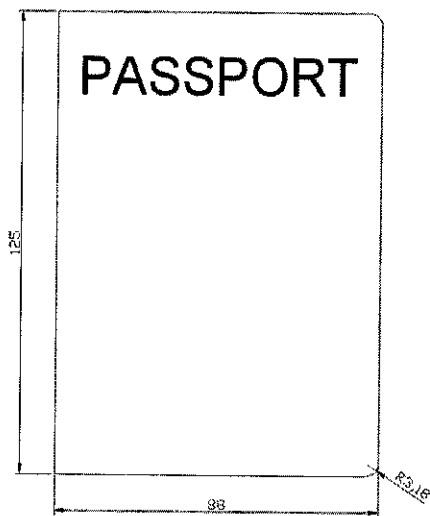
R3.18

Measures	Major
Height	< 124.25 / > 125.75 mm
Width	< 87.25 / > 88.75 mm

Passport booklet dimensions

88.0 mm x 125.0 mm x R3.18 mm*

5.3.6.2 Datapage

Datapage dimensions and tolerances based on ISO 7810 standard.

Sampling method ISO 2859-1 Special level 4 (S4) with AQL limits: AQL for dimensions: Major = 1.0

5.4 Pilot phase

Thales will deliver a first batch named "Pilot". Its approval will condition the starting of volume production.

The Buyer shall :

- Check if the provided products comply with the agreed and approved product design and specification
- Inspect the batch by sampling according to the methodology proposed in the acceptance catalogue and verifiy compliancy of quality level .
- In case the product contains a secure chip:
    - o check if the chip, its lifecycle state and its data complies with the specifications
    - o check if the chip can be properly personalized
    - o check if the personalized chip conforms to applicable standards
- Perform operational checks to assure that the products can fulfil their intended purpose.
- Approve the pilot batch if the above checks are passed

Pilot approval is a pre-requisite for the start of volume production. The pilot approval includes the approval of the products, chip personalization and the acceptance plans. After pilot approval, the Buyer shall provide the written certificate for pilot approval to Thales. Also at this step, the acceptance catalog will have to be completed and validated by both, Thales and Buyer to allow the production in mass volume.

5.5 Volume production phase

Thales will procure in advance various raw materials (e.g. project specific chips, modules, inlays, polycarbonate material etc.) and will start manufacturing in advance, so Thales will need the PO from the Buyer covering these activities right after the contract signature.

During factory production 100% of the products are tested electronically for chip response (Answer to reset, ATR). This is done at the end of production of each passport document.

The Buyer shall inspect every batch of delivery within a specified time period. A delegate can be a company or person authorized by the Buyer who is responsible to conduct the AQL inspection. Subject to a positive result of the inspection completed, the Buyer shall provide Thales within 20 calendar days the Certificate of Acceptance of the batch of Products to be delivered.

5.6   Management of rejects

In case the Buyer or their delegate rejects the products based on the agreed Acceptable Quality Limit (AQL), the Parties shall prepare an inspection test protocol detailing the reasons for non-approval. Such document shall be dated and signed by both Parties.

Products that are not accepted will be discarded. Such products may be reworked, sorted (with or without nonconforming items being replaced), scrapped, re-evaluated against more specific usability criteria, or held for additional information.

The Buyer may only claim compensation for Products whose deviations that are defined in this document and that are outside of the limits of the agreed Acceptance Plan and if the number of defects in a batch surpasses the defined Acceptable Quality Limit according to ISO 2859.

When new defects arise which are not included in the agreed acceptance catalogue, Thales and the Buyer shall agree on the description of such new defect and the limits to be added in the acceptance catalogue.

The following describes the process to handle warranty claims. The claimed Products will be re-manufactured by Thales and delivered by Thales free of charge.

For each claim, the Buyer shall send the defected Products, together with the signed excel claim sheet to Thales. Thales shall verify the claims internally and give feedback to the Buyer about the accepted number of claims.

In case of claim(s) rejected by Thales based on Thales analysis that objectively demonstrate that there is no defect, the Parties shall discuss in order to mutually agreed on the closure of to such claim(s).

In case a claim cannot be resolved through the described process the claim will be escalated to the responsible quality managers of the Buyer and Thales.

6. RISK MITIGATION

We have a large experience in similar projects and are able to quickly mobilize necessary resources during project implementation, leveraging our large network of delivery centers across the world in order to stick to committed planning.

6.1 Mastering the full value chain

We master the full value chain to reduce implementation risks:

> Design the artwork and security features (in house studio)

> Design and manufacture printing plates and lamination plates in house

> Develop our own secure embedded software (on several chips) and our cryptographic libraries

> Offer both security chips of the most renownd silicon vendors and our own in-house developed microcontroller solutions.

> Make our own inlays and chip modules

> Manufacture polycarbonate card in several production sites

> Do pre-personalization (chip initialization, laser markings at card)

> Develop and integrate our own enrolment, document management, personalization, post-issuance, identity management, border control and Digital ID Wallet solutions

> Provide enrolment, personalization and cyber security services for our customers

6.2 In House Operating System and Secure Software

Thales has developed its own secure embedded software, a key factor for ensuring reliability, chip portability, application flexibility and operational field requirements.

Thales also offers our in-house developped eTravel application with all mandatory and optional features specified by ICAO in the eMRTD specifications and fully compliant to EU regulations for biometric passports, residence permits and national ID cards.

6.3 Application of latest in-house cryptographic libarries

Thales has also developed its own cryptographic libraries leveraging our expertise and investment in security. This in-house development brings the following benefits:

> Frequent updates (every 6 to 8 months) ensuring strong resistance to the latest known attacks

> Reliability for our customers because they have been specifically designed for the Government market

> Ahead of evaluation, these crypto libraries are reviewed and tested by our team of experts in cryptography

6.4 Secure and reliable manufacturing

Thales operates several state-of-the-art manufacturing sites worldwide. Production environment, security and quality processes are certified by ISO 9001 (adherence to environmental standards), 14001 (quality processes), 14298 (Intergraf security printer requirements meeting governmental or central bank level), 27001 (IT security) in addition to Visa & Mastercard.

Business continuity is ensured by dual sourcing of key components. Leveraging large volumes and efficient material supply Thales can offer optimized lead times for unexpected peak demand.

7. WARRANTY CONDITIONS FOR PASSPORT BOOKLETS

The Products are warranted for a period of max. 10 years from the date of delivery by Thales. The duration of the Warranty Period for a given Purchase Order shall apply to all Products delivered by Thales pursuant to such Purchase Order.

The Buyer shall notify Thales of the defects in writing within three (3) months after the defects are discovered, and the notice shall thoroughly describe the conditions under which the defect has arisen in order to facilitate the diagnostic of the defect.

If the Products are found to be defective after analysis by Thales, the defects of the Products returned by the Buyer will either, at Thales's expense, be repaired or replaced, or be reimbursed at the price paid by the Buyer for the defective Products, at Thales's sole discretion. The property in the parts replaced shall pass to Thales upon delivery of the replacement.

The warranty is subject to Thales being able to qualify and audit the final Product and all the after-treatment processes of the Product (if any) at the Buyer's premises.

The Products are provided incompliance with the present offer and Thales's warranty hereunder is strictly limited to the repair or replacement of defective parts, or the reimbursement of the paid price. The above warranty shall apply only when the Products have been used and maintained in compliance with Thales's instructions for use and with the standard conditions of use.

Thales does not and shall not warrant that the Products will be resistant to all possible attacks and shall not incur, and disclaims, any liability in this respect. Even if each Product is compliant with current security standards in force on the date of their design, the Buyer acknowledges that the resistance of the security mechanisms necessarily evolve according to the state of the art in security and notably under the emergence of new attacks. Under no circumstances, shall Thales be held liable for any third party actions or claims and, in particular, in case of any successful attack against systems or equipment incorporating the Products.

The implementation of the warranty shall not extend the Warranty Period.

7.1 Storage

From the delivery of the Thales products to the Buyer, up to 1 (one) year's storage by the Buyer is warranted under the following conditions:

- Products to remain packaged in the original packaging provided by Supplier (except for incoming acceptance tests, but it should be repackaged after inspection to maintain proper storage conditions)
- Products boxes shall be stacked and stored only on flat and rigid surfaces
- Products shall be stored in an area away from combustion exhaust fumes and other sources of indoor pollution
- Environment should be clean and dry and not present any radiation, moisture or continuous sunlight.
- Ambient temperature of 21°C, plus or minus 5°
- Ambient humidity to range between 40% and 60%
- No rapid modification of the ambient temperature (no more than 5°C/min) and/or humidity, to avoid water condensation on the product
- It is recommended to consume products in FIFO principle to minimize the storage times.

7.2 Usage & Normal use

The standard conditions of use of a passport can be, among others, described in detail as follows: the purpose of a passport is that of a document that will be opened on an occasional basis when crossing borders or reproduced by photocopying for inclusion in requests for visas or administrative documents, in addition to being used to check the identity of its holder. It is intended to stand the stamping of a visa page at border control as well as the application of a visa sticker. It is supposed to be carried flat, that is not bent, folded or subject to mechanical stress, and inserted in other objects such as wallets, cases or clothes.

We recommend our Buyer to issue a notice to users to recommend a particular care of electronic passports, listing examples of abnormal conditions of use that may damage the integrated circuit (folding, pressure, tearing, extreme temperatures, high level of humidity, magnetic fields, microwaves, UV light...).

Normal use of a passport means that every such Passport must always and exclusively be used in a proper and customary way and be used only for its obviously intended purpose. A Passport shall in addition always be protected against external influences which might damage the Passport or shorten its lifetime.

For the avoidance of doubts this includes but is not limited to the following use:

- Any use of a Passport as a proof and verification of identity, age and other information that would be contained on a Passport that would involve verification through visual inspection of the Passport.
- Any use of a Passport as a travel document to cross national and international borders that would involve visual inspection of the Passport and / or accessing the data on the Passport.

Normal Use further includes that:

- A Passport shall be used with document readers with smooth surface as frequent placements on the reader do scratch the surface of the Datapage.
- A Passport must always be carried in a wallet, cases or similar device.
- A Passport must at all times be and remain protected against mechanical, thermal and chemical influences and impacts since these effects lower the durability of a Datapage including also its body materially. Exposure to extreme mechanical forces (bending, torsion, stamping, etc.) and exposure to extremes of light, fluids or aggressive gases, sweat, chemicals e.g. such as softeners, skin fat, saliva and extreme humidity must be avoided under all circumstances. All this – among other things – has an accelerated ageing effect on a Datapage.