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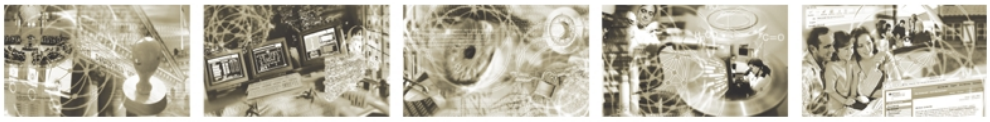

Common Criteria Protection Profile

Machine Readable Travel Document with „ICAO Application", Extended Access Control with PACE (EAC PP)

Common Criteria

BSI-CC-PP-0056-V2-2012 (Version 1.3.0, 20th January 2012)

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Foreword

This 'Protection Profile — Machine Readable Travel Document with ICAO Application (EAC PP), Extended Access Control with PACE' is issued by Bundesamt für Sicherheit in der Informationstechnik, Germany.

Throughout this document, the term PACE refers to PACE v2.

The ICAO Technical Report "Supplemental Access Control" [4] describes how to migrate from the current access control mechanism, Basic Access Control, to PACE v2, a new cryptographically strong access control mechanism that is initially provided supplementary to Basic Access Control:

"*There is no straightforward way to strengthen Basic Access Control as its limitations are inherent to the design of the protocol based on symmetric ("secret key") cryptography. A cryptographically strong access control mechanism must (additionally) use asymmetric ("public key") cryptography.*

This Technical Report specifies PACE as an access control mechanism that is supplemental to Basic Access Control. PACE MAY be implemented in addition to Basic Access Control, i.e.

- *States MUST NOT implement PACE without implementing Basic Access Control if global interoperability is required.*
- *Inspection Systems SHOULD implement and use PACE if provided by the MRTD chip.*

Note: Basic Access Control will remain the "default" access control mechanism for globally interoperable machine readable travel documents as long as Basic Access Control provides sufficient security. Basic Access Control may however become deprecated in the future. In this case PACE will become the default access control mechanism.

The inspection system SHALL use either BAC or PACE but not both in the same session."

Within the migration period, some developers will have to implement their products to functionally support both, PACE and Basic Access Control (BAC), i.e. Supplemental Access Control (SAC). However, any product using BAC will not be conformant to the current PP; i.e. a product implementing the TOE may functionally use BAC, but, while performing BAC, they are acting outside of security policy defined by the current PP. Therefore, organizations being responsible for the operation of inspection systems shall be aware of this context.

40 The document has been prepared as a Protection Profile (PP) following the rules and formats of Common Criteria version 3.1 [1], [2], [3], Revision 3.

Correspondence and comments to this Machine Readable Travel Document (EAC PP) should be referred to:

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1 PP Introduction

1.1 PP reference

Title:	Common Criteria Protection Profile — Machine Readable Travel Document with "ICAO Application", Extended Access Control with PACE (EAC PP)
Sponsor:	Bundesamt für Sicherheit in der Informationstechnik
CC Version:	3.1 (Revision 3)
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TOE Overview

The protection profile defines the security objectives and requirements for the contact based / contactless smart card of machine readable travel documents based on the requirements and recommendations of the International Civil Aviation Organization (ICAO). It addresses the advanced security methods Password Authenticated Connection Establishment, Extended Access Control, and Chip Authentication similar to the Active Authentication in 'ICAO Doc 9303' [6].

TOE definition

The Target of Evaluation (TOE) addressed by the current protection profile is an electronic travel document representing a contactless / contact smart card programmed according to ICAO Technical Report "Supplemental Access Control" [4] (which means amongst others according to the Logical Data Structure (LDS) defined in [6])and additionally providing the Extended Access Control according to the 'ICAO Doc 9303' [6] and BSI TR-03110 [5], respectively. The communication between terminal and chip shall be protected by Password Authenticated Connection Establishment (PACE) according to Electronic Passport using Standard Inspection Procedure with PACE (PACE PP), BSI-CC-PP-0068-V2 [7].

The TOE comprises of at least

- the circuitry of the travel document's chip (the integrated circuit, IC),
- the IC Dedicated Software with the parts IC Dedicated Test Software and IC Dedicated Support Software,
- the IC Embedded Software (operating system),
- the *ePassport application* and

- the associated guidance documentation.

TOE usage and security features for operational use

A State or Organisation issues travel documents to be used by the holder for international travel. The traveller presents a travel document to the inspection system to prove his or her identity. The travel document in context of this protection profile contains (i) visual (eye readable) biographical data and portrait of the holder, (ii) a separate data summary (MRZ data) for visual and machine reading using OCR methods in the Machine readable zone (MRZ) and (iii) data elements on the travel document's chip according to LDS in case of contactless machine reading. The authentication of the traveller is based on (i) the possession of a valid travel document personalised for a holder with the claimed identity as given on the biographical data page and (ii) biometrics using the reference data stored in the travel document. The issuing State or Organisation ensures the authenticity of the data of genuine travel documents. The receiving State trusts a genuine travel document of an issuing State or Organisation.

For this protection profile the travel document is viewed as unit of

(i) the **physical part of the travel document** in form of paper and/or plastic and chip. It presents visual readable data including (but not limited to) personal data of the travel document holder

(a) the biographical data on the biographical data page of the travel document surface,

(b) the printed data in the Machine Readable Zone (MRZ) and

(c) the printed portrait.

(ii) the **logical travel document** as data of the travel document holder stored according to the Logical Data Structure as defined in [6] as specified by ICAO on the contact based or contactless integrated circuit. It presents contact based / contactless readable data including (but not limited to) personal data of the travel document holder

(a) the digital Machine Readable Zone Data (digital MRZ data, EF.DG1),

(b) the digitized portraits (EF.DG2),

(c) the biometric reference data of finger(s) (EF.DG3) or iris image(s) (EF.DG4) or both[1]

(d) the other data according to LDS (EF.DG5 to EF.DG16) and

(e) the Document Security Object (SOD).

The issuing State or Organisation implements security features of the travel document to maintain the authenticity and integrity of the travel document and their data. The physical part of the travel document and the travel document's chip are identified by the Document Number.

The physical part of the travel document is protected by physical security measures (e.g. watermark, security printing), logical (e.g. authentication keys of the travel document's chip) and organisational security measures (e.g. control of materials, personalisation procedures) [6]. These security measures can include the binding of the travel document's chip to the travel document.

1 These biometric reference data are optional according to [6]. This PP assumes that the issuing State or Organisation uses this option and protects these data by means of extended access control.

The logical travel document is protected in authenticity and integrity by a digital signature created by the document signer acting for the issuing State or Organisation and the security
125 features of the travel document's chip.

The ICAO defines the baseline security methods Passive Authentication and the optional advanced security methods Basic Access Control to the logical travel document, Active Authentication of the travel document's chip, Extended Access Control to and the Data Encryption of sensitive biometrics as optional security measure in the ICAO Doc 9303 [6], and
130 Password Authenticated Connection Establishment [4]. The Passive Authentication Mechanism is performed completely and independently of the TOE by the TOE environment.

This protection profile addresses the protection of the logical travel document (i) in integrity by write-only-once access control and by physical means, and (ii) in confidentiality by the Extended Access Control Mechanism. This protection profile addresses the Chip
135 Authentication Version 1 described in [5] as an alternative to the Active Authentication stated in [6].

If BAC is supported by the TOE, the travel document has to be evaluated and certified separately. This is due to the fact that [8] does only consider extended basic attack potential to the Basic Access Control Mechanism (i.e. AVA_VAN.3).

140 The confidentiality by Password Authenticated Connection Establishment (PACE) is a mandatory security feature of the TOE. The travel document shall strictly conform to the 'Common Criteria Protection Profile Machine Readable Travel Document using Standard Inspection Procedure with PACE (PACE PP)' [7]. Note that [7] considers high attack potential.

For the PACE protocol according to [4], the following steps shall be performed:

145 (i) the travel document's chip encrypts a nonce with the shared password, derived from the MRZ resp. CAN data and transmits the encrypted nonce together with the domain parameters to the terminal.

(ii) The terminal recovers the nonce using the shared password, by (physically) reading the MRZ resp. CAN data.

150 (iii) The travel document's chip and terminal computer perform a Diffie-Hellmann key agreement together with the ephemeral domain parameters to create a shared secret. Both parties derive the session keys K_{MAC} and K_{ENC} from the shared secret.

(iv) Each party generates an authentication token, sends it to the other party and verifies the received token.

155 After successful key negotiation the terminal and the travel document's chip provide private communication (secure messaging) [5], [4].

The protection profile requires the TOE to implement the Extended Access Control as defined in [5]. The Extended Access Control consists of two parts (i) the Chip Authentication Protocol Version 1 and (ii) the Terminal Authentication Protocol Version 1 (v.1). The Chip
160 Authentication Protocol v.1 (i) authenticates the travel document's chip to the inspection

system and (ii) establishes secure messaging which is used by Terminal Authentication v.1 to protect the confidentiality and integrity of the sensitive biometric reference data during their transmission from the TOE to the inspection system. Therefore Terminal Authentication v.1 can only be performed if Chip Authentication v.1 has been successfully executed. The Terminal Authentication Protocol v.1 consists of (i) the authentication of the inspection system as entity authorized by the receiving State or Organisation through the issuing State, and (ii) an access control by the TOE to allow reading the sensitive biometric reference data only to successfully authenticated authorized inspection systems. The issuing State or Organisation authorizes the receiving State by means of certification the authentication public keys of Document Verifiers who create Inspection System Certificates.

TOE life-cycle

The TOE life-cycle is described in terms of the four life-cycle phases. (With respect to the [9], the TOE life-cycle the life-cycle is additionally subdivided into 7 steps.)

Phase 1 “Development”

(Step1) The TOE is developed in phase 1. The IC developer develops the integrated circuit, the IC Dedicated Software and the guidance documentation associated with these TOE components.

(Step2) The software developer uses the guidance documentation for the integrated circuit and the guidance documentation for relevant parts of the IC Dedicated Software and develops the IC Embedded Software (operating system), the ePassport application and the guidance documentation associated with these TOE components.

The manufacturing documentation of the IC including the IC Dedicated Software and the Embedded Software in the non-volatile non-programmable memories is securely delivered to the IC manufacturer. The IC Embedded Software in the non-volatile programmable memories, the ePassport application and the guidance documentation is securely delivered to the travel document manufacturer.

Phase 2 “Manufacturing”

(Step3) In a first step the TOE integrated circuit is produced containing the travel document’s chip Dedicated Software and the parts of the travel document’s chip Embedded Software in the non-volatile non-programmable memories (ROM). The IC manufacturer writes the IC Identification Data onto the chip to control the IC as travel document material during the IC manufacturing and the delivery process to the travel document manufacturer. The IC is securely delivered from the IC manufacture to the travel document manufacturer.

If necessary the IC manufacturer adds the parts of the IC Embedded Software in the non-volatile programmable memories (for instance EEPROM).

(Step4 optional) The travel document manufacturer combines the IC with hardware for the contact based / contactless interface in the travel document unless the travel document consists of the card only.

200 (Step5) The travel document manufacturer (i) adds the IC Embedded Software or part of it in the non-volatile programmable memories (for instance EEPROM or FLASH) if necessary, (ii) creates the ePassport application, and (iii) equips travel document's chips with pre-personalization Data.

Application Note 1: Creation of the application implies:

205 ◦ For file based operating systems: the creation of MF and ICAO.DF

◦ For JavaCard operating systems: the Applet instantiation.

The pre-personalised travel document together with the IC Identifier is securely delivered from the travel document manufacturer to the Personalisation Agent. The travel document manufacturer also provides the relevant parts of the guidance documentation to the
210 Personalisation Agent.

Phase 3 "Personalisation of the travel document"

(Step6) The personalisation of the travel document includes (i) the survey of the travel document holder's biographical data, (ii) the enrolment of the travel document holder biometric reference data (i.e. the digitized portraits and the optional biometric reference data), (iii) the
215 personalization of the visual readable data onto the physical part of the travel document, (iv) the writing of the TOE User Data and TSF Data into the logical travel document and (v) configuration of the TSF if necessary. The step (iv) is performed by the Personalisation Agent and includes but is not limited to the creation of (i) the digital MRZ data (EF.DG1), (ii) the digitized portrait (EF.DG2), and (iii) the Document security object.

220 The signing of the Document security object by the Document signer [6] finalizes the personalisation of the genuine travel document for the travel document holder. The personalised travel document (together with appropriate guidance for TOE use if necessary) is handed over to the travel document holder for operational use.

Application note 2: The TSF data (data created by and for the TOE, that might affect the
225 operation of the TOE; cf. [1] §92) comprise (but are not limited to) the Personalisation Agent Authentication Key(s), the Terminal Authentication trust anchor, the effective date and the Chip Authentication Private Key.

Application note 3: This protection profile distinguishes between the Personalisation Agent as entity known to the TOE and the Document Signer as entity in the TOE IT environment signing
230 the Document security object as described in [6]. This approach allows but does not enforce the separation of these roles.

Phase 4 "Operational Use"

(Step7) The TOE is used as a travel document's chip by the traveller and the inspection systems in the "Operational Use" phase. The user data can be read according to the security policy of
235 the issuing State or Organisation and can be used according to the security policy of the issuing State but they can never be modified.

Application note 4: The intention of the PP is to consider at least the phases 1 and parts of

phase 2 (i.e. Step1 to Step3) as part of the evaluation and therefore to define the TOE delivery according to CC after this phase. Since specific production steps of phase 2 are of minor security relevance (e.g. booklet manufacturing and antenna integration) these are not part of the CC evaluation under ALC. Nevertheless the decision about this has to be taken by the certification body resp. the national body of the issuing State or Organisation. In this case the national body of the issuing State or Organisation is responsible for these specific production steps.

Note that the personalisation process and its environment may depend on specific security needs of an issuing State or Organisation. All production, generation and installation procedures after TOE delivery up to the "Operational Use" (phase 4) have to be considered in the product evaluation process under AGD assurance class. Therefore, the Security Target has to outline the split up of P.Manufact, P.Personalisation and the related security objectives into aspects relevant before vs. after TOE delivery.

Some production steps, e.g. Step 4 in Phase 2 may also take place in the Phase 3.

Non-TOE hardware/software/firmware required by the TOE

There is no explicit non-TOE hardware, software or firmware required by the TOE to perform its claimed security features. The TOE is defined to comprise the chip and the complete operating system and application. Note, the inlay holding the chip as well as the antenna and the booklet (holding the printed MRZ) are needed to represent a complete travel document, nevertheless these parts are not inevitable for the secure operation of the TOE.

2 Conformance Claims

2.1 CC Conformance Claim

260 This protection profile claims conformance to

- Common Criteria for Information Technology Security Evaluation, Part 1: Introduction and General Model; CCMB-2009-07-001, Version 3.1, Revision 3, July 2009 [1]
- Common Criteria for Information Technology Security Evaluation, Part 2: Security Functional Components; CCMB-2009-07-002, Version 3.1, Revision 3, July 2009 [2]

265 - Common Criteria for Information Technology Security Evaluation, Part 3: Security Assurance Components; CCMB-2009-07-003, Version 3.1, Revision 3, July 2009 [3]

as follows

- Part 2 extended,
- Part 3 conformant.

270 The

- Common Methodology for Information Technology Security Evaluation, Evaluation Methodology; CCMB-2009-07-004, Version 3.1, Revision 3, July 2009, [10]

has to be taken into account.

2.2 PP Claim

275 This PP claims strict conformance to Protection Profile Machine Readable Travel Document using Standard Inspection Procedure with PACE (PACE PP), BSI-CC-PP-0068-V2 [7].

2.3 Package Claim

This PP is conforming to assurance package EAL4 augmented with ALC_DVS.2, ATE_DPT.2 and AVA_VAN.5 defined in CC part 3 [3].

280 2.4 Conformance rationale

The current PP claims strict conformance to the following protection profile as required: Machine Readable Travel Document using Standard Inspection Procedure with PACE (PACE PP), BSI-CC-PP-0068-V2 [7].

2.5 Conformance statement

285 This PP requires strict conformance of any ST or PP, which claims conformance to this PP.

3 Security Problem Definition

3.1 Introduction

Assets

The assets to be protected by the TOE include the User Data on the travel document's chip, user data transferred between the TOE and the terminal, and travel document tracing data from the claimed PACE PP [7], chap 3.1.

Logical travel document sensitive User Data

Sensitive biometric reference data (EF.DG3, EF.DG4)

Application note 5: Due to interoperability reasons the 'ICAO Doc 9303' [6] requires that Basic Inspection Systems may have access to logical travel document data DG1, DG2, DG5 to DG16. The TOE is not in certified mode, if it is accessed using BAC [6]. Note that the BAC mechanism cannot resist attacks with high attack potential (cf. [8]). If supported, it is therefore recommended to used PACE instead of BAC. If nevertheless BAC has to be used, it is recommended to perform Chip Authentication v.1 before getting access to data (except DG14), as this mechanism is resistant to high potential attacks

A sensitive asset is the following more general one.

Authenticity of the travel document's chip

The authenticity of the travel document's chip personalised by the issuing State or Organisation for the travel document holder is used by the traveller to prove his possession of a genuine travel document.

Due to strict conformance to PACE PP, this PP also includes all assets listed in [7], chap 3.1, namely the primary assets user data stored on the TOE (object 1), user data transferred between the TOE and the terminal connected (object 2), travel document tracing data (object 3), and the secondary assets accessibility to the TOE functions and data only for authorised subjects (object 4) Genuineness of the TOE (object 5), TOE intrinsic secret cryptographic keys (object 6), TOE intrinsic non secret cryptographic material (object 7), and travel document communication establishment authorisation data (object 8). Due to identical names and definitions these are not repeated here.

Subjects

This protection profile considers the following subjects additionally to those defined PACE PP [7]:

Country Verifying Certification Authority

The Country Verifying Certification Authority (CVCA) enforces the privacy policy of the issuing State or Organisation with respect to the protection of sensitive biometric reference data stored in the travel document. The CVCA represents the country specific root of the PKI of Inspection Systems and creates the Document Verifier Certificates within this PKI. The updates of the public key of the CVCA are distributed in the form of Country Verifying CA Link-Certificates.

Document Verifier

The Document Verifier (DV) enforces the privacy policy of the receiving State with respect to the protection of sensitive biometric reference data to be handled by the Extended Inspection Systems. The Document Verifier manages the authorization of the Extended Inspection Systems for the sensitive data of the travel document in the limits provided by the issuing States or Organisations in the form of the Document Verifier Certificates.

Terminal

A terminal is any technical system communicating with the TOE either through the contact interface or through the contactless interface.

Inspection system (IS)

A technical system used by the border control officer of the receiving State (i) examining an travel document presented by the traveller and verifying its authenticity and (ii) verifying the traveller as travel document holder.

The **Extended Inspection System (EIS)** performs the Advanced Inspection Procedure (figure 1) and therefore (i) contains a terminal for the communication with the travel document's chip, (ii) implements the terminals part of PACE and/or BAC; (iii) gets the authorization to read the logical travel document either under PACE or BAC by optical reading the travel document providing this information. (iv) implements the Terminal Authentication and Chip Authentication Protocols both Version 1 according to [5] and (v) is authorized by the issuing State or Organisation through the Document Verifier of the receiving State to read the sensitive biometric reference data. Security attributes of the EIS are defined by means of the Inspection System Certificates. BAC may only be used if supported by the TOE. If both PACE and BAC are supported by the TOE and the BIS, PACE must be used.

Application note 6: For definition of **Basic Inspection System (BIS)** resp. Basic Inspection System with PACE (BIS-PACE) see PACE PP [7].

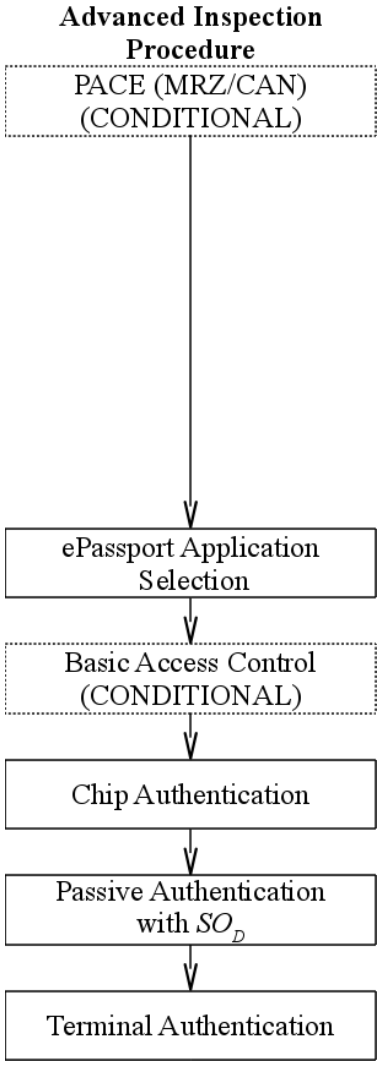


figure 1: Advanced Inspection Procedure

Attacker

350 Additionally to the definition from PACE PP [7], chap 3.1 the definition of an attacker is refined as followed: A threat agent trying (i) to manipulate the logical travel document without authorization, (ii) to read sensitive biometric reference data (i.e. EF.DG3, EF.DG4), (iii) to forge a genuine travel document, or (iv) to trace a travel document.

Application note 7: An impostor is attacking the inspection system as TOE IT environment
355 independent on using a genuine, counterfeit or forged travel document. Therefore the impostor may use results of successful attacks against the TOE but the attack itself is not relevant for the TOE.

This PP includes all subjects from the PACE Protection Profile [7], chap 3.1, namely Manufacturer, Personalisation Agent, Basic Inspection System (with PACE), Document Signer
360 (DS), and Country Signing Certification Authority (CSCA), Travel Document Holder and Travel Document Presenter (traveller). Due to identical definitions and names they are not repeated here.

3.2 Assumptions

The assumptions describe the security aspects of the environment in which the TOE will be
365 used or is intended to be used.

A.Insp_Sys Inspection Systems for global interoperability

The Extended Inspection System (EIS) for global interoperability (i) includes the Country Signing CA Public Key and (ii) implements the terminal part of PACE [4] and/or BAC [8]. BAC may only be used if supported by the TOE. If both PACE and BAC are supported by the
370 TOE and the IS, PACE must be used. The EIS reads the logical travel document under PACE or BAC and performs the Chip Authentication v.1 to verify the logical travel document and establishes secure messaging. EIS supports the Terminal Authentication Protocol v.1 in order to ensure access control and is authorized by the issuing State or Organisation through the Document Verifier of the receiving State to read the sensitive biometric reference data.

375 **Justification:**

The assumption A.Insp_Sys does not confine the security objectives of the [7] as it repeats the requirements of P.Terminal and adds only assumptions for the Inspection Systems for handling the the EAC functionality of the TOE.

A.Auth_PKI PKI for Inspection Systems

380 The issuing and receiving States or Organisations establish a public key infrastructure for card verifiable certificates of the Extended Access Control. The Country Verifying Certification Authorities, the Document Verifier and Extended Inspection Systems hold authentication key pairs and certificates for their public keys encoding the access control rights. The Country Verifying Certification Authorities of the issuing States or Organisations are signing the
385 certificates of the Document Verifier and the Document Verifiers are signing the certificates of the Extended Inspection Systems of the receiving States or Organisations. The issuing States or Organisations distribute the public keys of their Country Verifying Certification Authority to their travel document's chip.

Justification:

390 This assumption only concerns the EAC part of the TOE. The issuing and use of card verifiable certificates of the Extended Access Control is neither relevant for the PACE part of the TOE nor will the security objectives of the [7] be restricted by this assumption. For the EAC functionality of the TOE the assumption is necessary because it covers the pre-requisite for performing the Terminal Authentication Protocol Version 1.

395 This PP includes the assumption from the PACE PP [7], chap 3.4, namely A.Passive_Auth.

3.3 Threats

This section describes the threats to be averted by the TOE independently or in collaboration

with its IT environment. These threats result from the TOE method of use in the operational environment and the assets stored in or protected by the TOE.

400 The TOE in collaboration with its IT environment shall avert the threats as specified below.

T.Read_Sensitive_Data Read the sensitive biometric reference data

Adverse action: An attacker tries to gain the sensitive biometric reference data through the communication interface of the travel document's chip.
The attack T.Read_Sensitive_Data is similar to the threat T.Skimming (cf. [8])
405 in respect of the attack path (communication interface) and the motivation (to get data stored on the travel document's chip) but differs from those in the asset under the attack (sensitive biometric reference data vs. digital MRZ, digitized portrait and other data), the opportunity (i.e. knowing the PACE Password) and therefore the possible attack methods. Note, that the sensitive
410 biometric reference data are stored only on the travel document's chip as private sensitive personal data whereas the MRZ data and the portrait are visually readable on the physical part of the travel document as well.

Threat agent: having high attack potential, knowing the PACE Password, being in possession of a legitimate travel document

415 Asset: confidentiality of logical travel document sensitive user data (i.e. biometric reference)

T.Counterfeit Counterfeit of travel document chip data

Adverse action: An attacker with high attack potential produces an unauthorized copy or reproduction of a genuine travel document's chip to be used as part of a
420 counterfeit travel document. This violates the authenticity of the travel document's chip used for authentication of a traveller by possession of a travel document.
The attacker may generate a new data set or extract completely or partially the data from a genuine travel document's chip and copy them to another
425 appropriate chip to imitate this genuine travel document's chip.

Threat agent: having high attack potential, being in possession of one or more legitimate travel documents

Asset: authenticity of user data stored on the TOE

This PP includes all threats from the PACE PP [7], chap 3.2, namely T.Skimming,
430 T.Eavesdropping, T.Tracing, T.Abuse-Func, T.Information_Leakage, T.Phys-Tamper, T.Forgery and T.Malfunction. Due to identical definitions and names they are not repeated here as well.

Application note 8: T.Forgery from the PACE PP [7] shall be extended by the Extended Inspection System additionally to the PACE authenticated BIS-PACE being outsmarted by the
435 attacker.

3.4 Organisational Security Policies

The TOE shall comply with the following Organisational Security Policies (OSP) as security rules, procedures, practices, or guidelines imposed by an organisation upon its operations (see CC part 1, sec. 3.2).

440 **P.Sensitive_Data Privacy of sensitive biometric reference data**

The biometric reference data of finger(s) (EF.DG3) and iris image(s) (EF.DG4) are sensitive private personal data of the travel document holder. The sensitive biometric reference data can be used only by inspection systems which are authorized for this access at the time the travel document is presented to the inspection system (Extended Inspection Systems). The issuing
445 State or Organisation authorizes the Document Verifiers of the receiving States to manage the authorization of inspection systems within the limits defined by the Document Verifier Certificate. The travel document's chip shall protect the confidentiality and integrity of the sensitive private personal data even during transmission to the Extended Inspection System after Chip Authentication Version 1.

450 **P.Personalisation Personalisation of the travel document by issuing State or Organisation only**

The issuing State or Organisation guarantees the correctness of the biographical data, the printed portrait and the digitized portrait, the biometric reference data and other data of the logical travel document with respect to the travel document holder. The personalisation of the
455 travel document for the holder is performed by an agent authorized by the issuing State or Organisation only.

This PP includes all OSPs from the PACE PP [7], chap 3.3, namely P.Pre-Operational, P.Card_PKI, P.Trustworthy_PKI, P.Manufact and P.Terminal. Due to identical definitions and names they are also not repeated here.

4 Security Objectives

This chapter describes the security objectives for the TOE and the security objectives for the TOE environment. The security objectives for the TOE environment are separated into security objectives for the development and production environment and security objectives for the operational environment.

4.1 Security Objectives for the TOE

This section describes the security objectives for the TOE addressing the aspects of identified threats to be countered by the TOE and organisational security policies to be met by the TOE.

OT.Sens_Data_Conf Confidentiality of sensitive biometric reference data

The TOE must ensure the confidentiality of the sensitive biometric reference data (EF.DG3 and EF.DG4) by granting read access only to authorized Extended Inspection Systems. The authorization of the inspection system is drawn from the Inspection System Certificate used for the successful authentication and shall be a non-strict subset of the authorization defined in the Document Verifier Certificate in the certificate chain to the Country Verifier Certification Authority of the issuing State or Organisation. The TOE must ensure the confidentiality of the logical travel document data during their transmission to the Extended Inspection System. The confidentiality of the sensitive biometric reference data shall be protected against attacks with high attack potential.

OT.Chip_Auth_Proof Proof of the travel document's chip authenticity

The TOE must support the Inspection Systems to verify the identity and authenticity of the travel document's chip as issued by the identified issuing State or Organisation by means of the Chip Authentication Version 1 as defined in [5]. The authenticity proof provided by travel document's chip shall be protected against attacks with high attack potential.

Application note 9: The OT.Chip_Auth_Proof implies the travel document's chip to have (i) a unique identity as given by the travel document's Document Number, (ii) a secret to prove its identity by knowledge i.e. a private authentication key as TSF data. The TOE shall protect this TSF data to prevent their misuse. The terminal shall have the reference data to verify the authentication attempt of travel document's chip i.e. a certificate for the Chip Authentication Public Key that matches the Chip Authentication Private Key of the travel document's chip. This certificate is provided by (i) the Chip Authentication Public Key (EF.DG14) in the LDS defined in [6] and (ii) the hash value of DG14 in the Document Security Object signed by the Document Signer.

This PP includes all Security Objectives for the TOE from the PACE PP [7], chap 4.1, namely OT.Data_Integrity, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Tracing, OT.Prot_Abuse-Func, OT.Prof_Inf_Leak, OT.Prot_Phys-Tamper, OT.Identification, OT.AC_Pers and OT.Prot_Malfunction. Due to identical definitions and names they are not repeated here as well.

4.2 Security Objectives for the Operational Environment

Issuing State or Organisation

The issuing State or Organisation will implement the following security objectives of the TOE environment.

OE.Auth_Key_Travel_Document Travel document Authentication Key

The issuing State or Organisation has to establish the necessary public key infrastructure in order to (i) generate the travel document's Chip Authentication Key Pair, (ii) sign and store the Chip Authentication Public Key in the Chip Authentication Public Key data in EF.DG14 and (iii) support inspection systems of receiving States or Organisations to verify the authenticity of the travel document's chip used for genuine travel document by certification of the Chip Authentication Public Key by means of the Document Security Object.

Justification: This security objective for the operational environment is needed additionally to those from [7] in order to counter the Threat T.Counterfeit as it specifies the pre-requisite for the Chip Authentication Protocol Version 1 which is one of the additional features of the TOE described only in this Protection Profile and not in [7].

OE.Authoriz_Sens_Data Authorization for Use of Sensitive Biometric Reference Data

The issuing State or Organisation has to establish the necessary public key infrastructure in order to limit the access to sensitive biometric reference data of travel document holders to authorized receiving States or Organisations. The Country Verifying Certification Authority of the issuing State or Organisation generates card verifiable Document Verifier Certificates for the authorized Document Verifier only.

Justification: This security objective for the operational environment is needed additionally to those from [7] in order to handle the Threat T.Read_Sensitive_Data, the Organisational Security Policy P.Sensitive_Data and the Assumption A.Auth_PKI as it specifies the pre-requisite for the Terminal Authentication Protocol v.1 as it concerns the need of an PKI for this protocol and the responsibilities of its root instance. The Terminal Authentication Protocol v.1 is one of the additional features of the TOE described only in this Protection Profile and not in [7].

Receiving State or Organisation

The receiving State or Organisation will implement the following security objectives of the TOE environment.

OE.Exam_Travel_Document Examination of the physical part of the travel document

The inspection system of the receiving State or Organisation must examine the travel document presented by the traveller to verify its authenticity by means of the physical security measures and to detect any manipulation of the physical part of the travel document. The Basic Inspection System for global interoperability (i) includes the Country Signing CA Public Key

and the Document Signer Public Key of each issuing State or Organisation, and (ii) implements the terminal part of PACE [4] and/or the Basic Access Control [6]. Extended Inspection Systems perform additionally to these points the Chip Authentication Protocol Version 1 to verify the Authenticity of the presented travel document's chip.

Justification: This security objective for the operational environment is needed additionally to those from [7] in order to handle the Threat T.Counterfeit and the Assumption A.Insp_Sys by demanding the Inspection System to perform the Chip Authentication protocol v.1. OE.Exam_Travel_Document also repeats partly the requirements from OE.Terminal in [7] and therefore also counters T.Forgery and A.Passive_Auth from [7]. This is done because a new type of Inspection System is introduced in this PP as the Extended Inspection System is needed to handle the additional features of a travel document with Extended Access Control.

OE.Prot_Logical_Travel_Document Protection of data from the logical travel document

The inspection system of the receiving State or Organisation ensures the confidentiality and integrity of the data read from the logical travel document. The inspection system will prevent eavesdropping to their communication with the TOE before secure messaging is successfully established based on the Chip Authentication Protocol Version 1.

Justification: This security objective for the operational environment is needed additionally to those from [7] in order to handle the Assumption A.Insp_Sys by requiring the Inspection System to perform secure messaging based on the Chip Authentication Protocol v.1.

OE.Ext_Insp_Systems Authorization of Extended Inspection Systems

The Document Verifier of receiving States or Organisations authorizes Extended Inspection Systems by creation of Inspection System Certificates for access to sensitive biometric reference data of the logical travel document. The Extended Inspection System authenticates themselves to the travel document's chip for access to the sensitive biometric reference data with its private Terminal Authentication Key and its Inspection System Certificate.

Justification: This security objective for the operational environment is needed additionally to those from [7] in order to handle the Threat T.Read_Sensitive_Data, the Organisational Security Policy P.Sensitive_Data and the Assumption A.Auth_PKI as it specifies the pre-requisite for the Terminal Authentication Protocol v.1 as it concerns the responsibilities of the Document Verifier instance and the Inspection Systems.

This PP includes all Security Objectives of the TOE environment from the PACE PP [7], chap. 4.2, namely OE.Legislative_Compliance, OE.Passive_Auth_Sign, OE.Personalisation, OE.Terminal, and OE.Travel_Document_Holder. Due to identical definitions and names they are not repeated here.

4.3 Security Objective Rationale

The following table provides an overview for security objectives coverage.

	OT.Sens_Data_Conf	OT.Chip_Auth_Proof	*OT.AC_Pers*[2]	*OT.Data_Integrity*	*OT.Data_Authenticity*	*OT.Data_Confidentiality*	*OT.Tracing*	*OT.Prot_Abuse-Func*	*OT.Prot_Inf_Leak*	*OT.Identification*	*OT.Prot_Phys-Tamper*	*OT.Prot_Malfuntion*	OE.Auth_Key_Travel_Document	OE.Authoriz_Sens_Data	OE.Exam_Travel_Document	OE.Prot_Logical_Travel_Document	OE.Ext_Insp_Systems	*OE.Personalisation*	*OE.Passive_Auth_Sign*	*OE.Terminal*	*OE.Travel_Document_Holder*	*OE.Legislative_Compliance*
T.Read_Sensitive_Data	x													x			x					
T.Counterfeit		x											x		x							
T.Skimming[3]				x	x	x															x	
T.Eavesdropping						x																
T.Tracing							x														x	
T.Abuse-Func								x														
T.Information_Leakage									x													
T.Phys-Tamper											x											
T.Malfunction												x										
T.Forgery			x	x	x			x			x				x			x	x	x		
P.Sensitive_Data	x													x			x					
P.Personalisation			x							x								x				
P.Manufact										x												
P.Pre-Operational			x							x								x				x
P.Terminal															x					x		
P.Card_PKI																			x			
P.Trustworthy_PKI																			x			
A.Insp_Sys															x	x						
A.Auth_PKI														x			x					
A.Passive_Auth															x				x			

2 The Objectives marked *in italic letters* are included from the claimed PACE-PP [7]. They are listed for the complete overview of the security objectives.

3 Threats and assumptions included from the claimed PACE-PP [7] are marked *in italic letters.* They are listed for the complete overview of threats and assumptions.

Table 1: Security Objective Rationale

The OSP **P.Personalisation** "Personalisation of the travel document by issuing State or Organisation only" addresses the (i) the enrolment of the logical travel document by the Personalisation Agent as described in the security objective for the TOE environment **OE.Personalisation** "Personalisation of logical travel document", and (ii) the access control for the user data and TSF data as described by the security objective **OT.AC_Pers** "Access Control for Personalisation of logical travel document". Note the manufacturer equips the TOE with the Personalisation Agent Key(s) according to **OT.Identification** "Identification and Authentication of the TOE". The security objective **OT.AC_Pers** limits the management of TSF data and the management of TSF to the Personalisation Agent.

The OSP **P.Sensitive_Data** "Privacy of sensitive biometric reference data" is fulfilled and the threat **T.Read_Sensitive_Data** "Read the sensitive biometric reference data" is countered by the TOE-objective **OT.Sens_Data_Conf** "Confidentiality of sensitive biometric reference data" requiring that read access to EF.DG3 and EF.DG4 (containing the sensitive biometric reference data) is only granted to authorized inspection systems. Furthermore it is required that the transmission of these data ensures the data's confidentiality. The authorization bases on Document Verifier certificates issued by the issuing State or Organisation as required by **OE.Authoriz_Sens_Data** "Authorization for use of sensitive biometric reference data". The Document Verifier of the receiving State has to authorize Extended Inspection Systems by creating appropriate Inspection System certificates for access to the sensitive biometric reference data as demanded by **OE.Ext_Insp_Systems** "Authorization of Extended Inspection Systems".

The OSP **P.Terminal** "Abilities and trustworthiness of terminals" is countered by the security objective **OE.Exam_Travel_Document** additionally to the security objectives from PACE PP [7]. **OE.Exam_Travel_Document** enforces the terminals to perform the terminal part of the PACE protocol.

The threat **T.Counterfeit** "Counterfeit of travel document chip data" addresses the attack of unauthorized copy or reproduction of the genuine travel document's chip. This attack is thwarted by chip an identification and authenticity proof required by **OT.Chip_Auth_Proof** "Proof of travel document's chip authentication" using an authentication key pair to be generated by the issuing State or Organisation. The Public Chip Authentication Key has to be written into EF.DG14 and signed by means of Documents Security Objects as demanded by **OE.Auth_Key_Travel_Document** "Travel document Authentication Key". According to **OE.Exam_Travel_Document** "Examination of the physical part of the travel document" the General Inspection system has to perform the Chip Authentication Protocol Version 1 to verify the authenticity of the travel document's chip.

The threat **T.Forgery** "Forgery of data" addresses the fraudulent, complete or partial alteration of the User Data or/and TSF-data stored on the TOE or/and exchanged between the TOE and the terminal. Additionally to the security objectives from PACE PP [7] which counter this threat, the examination of the presented MRTD passport book according to **OE.Exam_Travel_Document** "Examination of the physical part of the travel document" shall ensure its authenticity by means of the physical security measures and detect any manipulation of the physical part of the travel document.

The examination of the travel document addressed by the assumption **A.Insp_Sys** “Inspection Systems for global interoperability” is covered by the security objectives for the TOE environment **OE.Exam_Travel_Document** “Examination of the physical part of the travel document” which requires the inspection system to examine physically the travel document, the Basic Inspection System to implement the Basic Access Control, and the Extended Inspection Systems to implement and to perform the Chip Authentication Protocol Version 1 to verify the Authenticity of the presented travel document’s chip. The security objectives for the TOE environment **OE.Prot_Logical_Travel_Document** “Protection of data from the logical travel document” require the Inspection System to protect the logical travel document data during the transmission and the internal handling.

The assumption **A.Passive_Auth** “PKI for Passive Authentication” is directly covered by the security objective for the TOE environment **OE.Passive_Auth_Sign** “Authentication of travel document by Signature” from PACE PP [7] covering the necessary procedures for the Country Signing CA Key Pair and the Document Signer Key Pairs. The implementation of the signature verification procedures is covered by **OE.Exam_Travel_Document** “Examination of the physical part of the travel document”.

The assumption **A.Auth_PKI** “PKI for Inspection Systems” is covered by the security objective for the TOE environment **OE.Authoriz_Sens_Data** “Authorization for use of sensitive biometric reference data” requires the CVCA to limit the read access to sensitive biometrics by issuing Document Verifier certificates for authorized receiving States or Organisations only. The Document Verifier of the receiving State is required by **OE.Ext_Insp_Systems** “Authorization of Extended Inspection Systems” to authorize Extended Inspection Systems by creating Inspection System Certificates. Therefore, the receiving issuing State or Organisation has to establish the necessary public key infrastructure.

5 Extended Components Definition

This protection profile uses components defined as extensions to CC part 2. Some of these components are defined in [8], other components are defined in this protection profile.

5.1 Definition of the Family FIA_API

To describe the IT security functional requirements of the TOE a sensitive family (FIA_API) of the Class FIA (Identification and authentication) is defined here. This family describes the functional requirements for the proof of the claimed identity for the authentication verification by an external entity where the other families of the class FIA address the verification of the identity of an external entity.

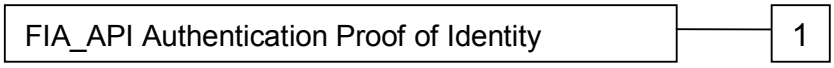
Application note 10: The other families of the Class FIA describe only the authentication verification of users' identity performed by the TOE and do not describe the functionality of the user to prove their identity. The following paragraph defines the family FIA_API in the style of the Common Criteria part 2 (cf. [3], chapter "Explicitly stated IT security requirements (APE_SRE)") from a TOE point of view.

FIA_API Authentication Proof of Identity

Family behaviour

This family defines functions provided by the TOE to prove their identity and to be verified by an external entity in the TOE IT environment.

Component levelling:



FIA_API.1 Authentication Proof of Identity.

Management: FIA_API.1

The following actions could be considered for the management functions in FMT: Management of authentication information used to prove the claimed identity.

Audit: There are no actions defined to be auditable.

FIA_API.1 Authentication Proof of Identity

Hierarchical to: No other components.

Dependencies: No dependencies.

FIA_API.1.1 The TSF shall provide a [assignment: *authentication mechanism*] to

prove the identity of the [assignment: *authorized user or role*].

665 This PP includes all Extended Component Definitions from the PACE PP [7], chap. 5, namely FAU_SAS, FCS_RND, FMT_LIM, FPT_EMS. These definitions are taken over as described in [7], therefore they are not repeated here.

6 Security Requirements

The CC allows several operations to be performed on functional requirements; *refinement*, *selection*, *assignment*, and *iteration* are defined in paragraph C.4 of Part 1 [1] of the CC. Each of these operations is used in this PP.

The **refinement** operation is used to add detail to a requirement, and thus further restricts a requirement. Refinement of security requirements is denoted by the word "refinement" in bold text and the added/changed words are in **bold text**. In cases where words from a CC requirement were deleted, a separate attachment indicates the words that were removed.

The **selection** operation is used to select one or more options provided by the CC in stating a requirement. Selections that have been made by the PP authors are denoted as underlined text and the original text of the component is given by a footnote. Selections to be filled in by the ST author appear in square brackets with an indication that a selection is to be made, [selection:], and are *italicized.*

The **assignment** operation is used to assign a specific value to an unspecified parameter, such as the length of a password. Assignments that have been made by the PP authors are denoted by showing as underlined text and the original text of the component is given by a footnote. Assignments to be filled in by the ST author appear in square brackets with an indication that an assignment is to be made [assignment:], and are *italicized*. In some cases the assignment made by the PP authors defines a selection to be performed by the ST author. Thus this text is underlined and italicized like *this*.

The **iteration** operation is used when a component is repeated with varying operations. Iteration is denoted by showing a slash "/", and the iteration indicator after the component identifier.

The definition of the subjects "Manufacturer", "Personalisation Agent", "Extended Inspection System", "Country Verifying Certification Authority", "Document Verifier" and "Terminal" used in the following chapter is given in section 3.1. Note, that all these subjects are acting for homonymous external entities. All used objects are defined either in section 7 or in the following table. The operations "write", "modify", "read" and "disable read access" are used in accordance with the general linguistic usage. The operations "store", "create", "transmit", "receive", "establish communication channel", "authenticate" and "re-authenticate" are originally taken from [2]. The operation "load" is synonymous to "import" used in [2].

Definition of security attributes:

security attribute	values	meaning
terminal authentication status	none (any Terminal)	default role (i.e. without authorisation after start-up)
	CVCA	roles defined in the certificate used for authentication (cf. [5]); Terminal is authenticated as Country Verifying Certification Authority after successful CA v.1 and TA v.1
	DV (domestic)	roles defined in the certificate used for authentication (cf. [5]); Terminal is authenticated as domestic Document Verifier after successful CA v.1 and TA v.1
	DV (foreign)	roles defined in the certificate used for authentication (cf. [5]); Terminal is authenticated as foreign Document Verifier after successful CA v.1 1 and TA v.1
	IS	roles defined in the certificate used for authentication (cf. [5]); Terminal is authenticated as Extended Inspection System after successful CA v.1 and TA v.1
Terminal Authorization	none	
	DG4 (Iris)	Read access to DG4: (cf. [5])
	DG3 (Fingerprint)	Read access to DG3: (cf. [5])
	DG3 (Fingerprint) / DG4 (Iris)	Read access to DG3 and DG4: (cf. [5])

Table 2: Definition of security attributes

700 The following table provides an overview of the keys and certificates used. Further keys and certificates are listed in [7].

Name	Data
TOE intrinsic secret cryptographic keys	Permanently or temporarily stored secret cryptographic material used by the TOE in order to enforce its security functionality.
Country Verifying Certification Authority Private Key (SK_{CVCA})	The Country Verifying Certification Authority (CVCA) holds a private key (SK_{CVCA}) used for signing the Document Verifier Certificates.
Country Verifying	The TOE stores the Country Verifying Certification Authority

Name	Data
Certification Authority Public Key (PK_{CVCA})	Public Key (PK_{CVCA}) as part of the TSF data to verify the Document Verifier Certificates. The PK_{CVCA} has the security attribute Current Date as the most recent valid effective date of the Country Verifying Certification Authority Certificate or of a domestic Document Verifier Certificate.
Country Verifying Certification Authority Certificate (C_{CVCA})	The Country Verifying Certification Authority Certificate may be a self-signed certificate or a link certificate (cf. [5] and Glossary). It contains (i) the Country Verifying Certification Authority Public Key (PK_{CVCA}) as authentication reference data, (ii) the coded access control rights of the Country Verifying Certification Authority, (iii) the Certificate Effective Date and the Certificate Expiration Date as security attributes.
Document Verifier Certificate (C_{DV})	The Document Verifier Certificate C_{DV} is issued by the Country Verifying Certification Authority. It contains (i) the Document Verifier Public Key (PK_{DV}) as authentication reference data (ii) identification as domestic or foreign Document Verifier, the coded access control rights of the Document Verifier, the Certificate Effective Date and the Certificate Expiration Date as security attributes.
Inspection System Certificate (C_{IS})	The Inspection System Certificate (C_{IS}) is issued by the Document Verifier. It contains (i) as authentication reference data the Inspection System Public Key (PK_{IS}), (ii) the coded access control rights of the Extended Inspection System, the Certificate Effective Date and the Certificate Expiration Date as security attributes.
Chip Authentication Public Key Pair	The Chip Authentication Public Key Pair (SK_{ICC}, PK_{ICC}) are used for Key Agreement Protocol: Diffie-Hellman (DH) according to RFC 2631 or Elliptic Curve Diffie-Hellman according to ISO 11770-3 [11].
Chip Authentication Public Key (PK_{ICC})	The Chip Authentication Public Key (PK_{ICC}) is stored in the EF.DG14 Chip Authentication Public Key of the TOE's logical travel document and used by the inspection system for Chip Authentication Version 1 of the travel document's chip. It is part of the user data provided by the TOE for the IT environment.
Chip Authentication Private Key (SK_{ICC})	The Chip Authentication Private Key (SK_{ICC}) is used by the TOE to authenticate itself as authentic travel document's chip. It is part of the TSF data.
Country Signing Certification Authority Key Pair	Country Signing Certification Authority of the issuing State or Organisation signs the Document Signer Public Key Certificate with the Country Signing Certification Authority Private Key and the signature will be verified by receiving State or Organisation (e.g. an Extended Inspection System) with the Country Signing Certification Authority Public Key.
Document Signer Key Pairs	Document Signer of the issuing State or Organisation signs the Document Security Object of the logical travel document with the Document Signer Private Key and the signature will be verified by

Name	Data
	an Extended Inspection System of the receiving State or Organisation with the Document Signer Public Key.
Chip Authentication Session Keys	Secure messaging encryption key and MAC computation key agreed between the TOE and an Inspection System in result of the Chip Authentication Protocol Version 1.
PACE Session Keys	Secure messaging encryption key and MAC computation key agreed between the TOE and an Inspection System in result of PACE.

Table 3: Keys and certificates

Application note 11: The Country Verifying Certification Authority identifies a Document Verifier as "domestic" in the Document Verifier Certificate if it belongs to the same State as the Country Verifying Certification Authority. The Country Verifying Certification Authority
705 identifies a Document Verifier as "foreign" in the Document Verifier Certificate if it does not belong to the same State as the Country Verifying Certification Authority. From travel document's point of view the domestic Document Verifier belongs to the issuing State or Organisation.

6.1 Security Functional Requirements for the TOE

710 This section on security functional requirements for the TOE is divided into sub-section following the main security functionality. SFRs from the PACE PP are not repeated in this PP but listed in Table 4. Only those SFRs from PACE PP extended in this PP are written down below.

SFRs to be taken from PACE PP [7]
FAU_SAS.1
FCS_CKM.1/DH_PACE
FCS_CKM.4[4]
FCS_COP.1/PACE_ENC
FCS_COP.1/PACE_MAC
FCS_RND.1[5]
FIA_AFL.1/PACE
FIA_UAU.6/PACE
FDP_RIP.1[6]
FDP_UCT.1/TRM[7]

4 Please also refer to Application note 15 in this EAC PP

5 Please also refer to Application note 26 in this EAC PP

6 Please also refer to Application note 15 in this EAC PP

7 Please also refer to Application note 35 in this EAC PP

SFRs to be taken from PACE PP [7]
FDP_UIT.1/TRM[8]
FMT_SMF.1
FMT_MTD.1/INI_ENA
FMT_MTD.1/INI_DIS
FMT_MTD.1/PA
FPT_TST.1
FPT_FLS.1
FPT_PHP.3
FTP_ITC.1/PACE[9]

Table 4: SFRs to be taken from PACE PP [7]

6.1.1 Class Cryptographic Support (FCS)

715 The TOE shall meet the requirement "Cryptographic key generation (FCS_CKM.1)" as specified below (Common Criteria Part 2). The iterations are caused by different cryptographic key generation algorithms to be implemented and key to be generated by the TOE.

FCS_CKM.1/CA Cryptographic key generation – Diffie-Hellman for Chip Authentication session keys

720 Hierarchical to: No other components.

Dependencies: [FCS_CKM.2 Cryptographic key distribution or
FCS_COP.1 Cryptographic operation]
FCS_CKM.4 Cryptographic key destruction

FCS_CKM.1.1/CA The TSF shall generate cryptographic keys in accordance with a specified cryptographic key generation algorithm [assignment: *cryptographic key generation algorithm*] and specified cryptographic key sizes [*assignment: cryptographic key sizes*] that meet the following:[selection: *based on the Diffie-Hellman key derivation protocol compliant to [12] and [5], based on an ECDH protocol compliant to [13]*][10]

Application note 12: FCS_CKM.1/CA implicitly contains the requirements for the hashing
725 functions used for key derivation by demanding compliance to [5].

Application note 13: The TOE generates a shared secret value with the terminal during the Chip Authentication Protocol Version 1, see [5]. This protocol may be based on the Diffie-

8 Please also refer to Application note 35 in this EAC PP

9 Please also refer to Application note 25 in this EAC PP

10 [assignment: *list of standards*]

Hellman-Protocol compliant to PKCS#3 (i.e. modulo arithmetic based cryptographic algorithm, cf. [12]) or on the ECDH compliant to TR-03111 (i.e. an elliptic curve cryptography algorithm) (cf. [13], for details). The shared secret value is used to derive the Chip Authentication Session Keys used for encryption and MAC computation for secure messaging (defined in Key Derivation Function [5]).

Application note 14: The TOE shall implement the hash function SHA-1 for the cryptographic primitive to derive the keys for secure messaging from any shared secrets of the Authentication Mechanisms. The Chip Authentication Protocol v.1 may use SHA-1 (cf. [5]). The TOE may implement additional hash functions SHA-224 and SHA-256 for the Terminal Authentication Protocol v.1 (cf. [5] for details).

Application note 15: The TOE shall destroy any session keys in accordance with FCS_CKM.4 from [7] after (i) detection of an error in a received command by verification of the MAC and (ii) after successful run of the Chip Authentication Protocol v.1. (iii) The TOE shall destroy the PACE Session Keys after generation of a Chip Authentication Session Keys and changing the secure messaging to the Chip Authentication Session Keys. (iv) The TOE shall clear the memory area of any session keys before starting the communication with the terminal in a new after-reset-session as required by FDP_RIP.1. Concerning the Chip Authentication keys FCS_CKM.4 is also fulfilled by FCS_CKM.1/CA.

6.1.1.1 Cryptographic operation (FCS_COP.1)

The TOE shall meet the requirement "Cryptographic operation (FCS_COP.1)" as specified below (Common Criteria Part 2). The iterations are caused by different cryptographic algorithms to be implemented by the TOE.

FCS_COP.1/CA_ENC Cryptographic operation – Symmetric Encryption / Decryption

Hierarchical to:	No other components.
Dependencies:	[FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation] FCS_CKM.4 Cryptographic key destruction
FCS_COP.1.1/ CA_ENC	The TSF shall perform secure messaging – encryption and decryption [11] in accordance with a specified cryptographic algorithm [assignment: *cryptographic algorithm*] and cryptographic key sizes [assignment: *cryptographic key sizes*] that meet the following: [assignment: *list of standards*].

Application note 16: This SFR requires the TOE to implement the cryptographic primitives (e.g. Triple-DES and/or AES) for secure messaging with encryption of the transmitted data. The keys are agreed between the TOE and the terminal as part of the Chip Authentication Protocol Version 1 according to the FCS_CKM.1/CA.

11 [assignment: *list of cryptographic operations*]

FCS_COP.1/SIG_VER Cryptographic operation – Signature verification by travel document

Hierarchical to: No other components.

Dependencies: [FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation]
FCS_CKM.4 Cryptographic key destruction

FCS_COP.1.1/ SIG_VER: The TSF shall perform digital signature verification [12] in accordance with a specified cryptographic algorithm [assignment: *cryptographic algorithm*] and cryptographic key sizes [assignment: *cryptographic key sizes*] that meet the following: [assignment: *list of standards*].

Application note 17: The ST writer shall perform the missing operation of the assignments for the signature algorithms key lengths and standards implemented by the TOE for the Terminal Authentication Protocol v.1 (cf. [5]). The signature verification is used to verify the card verifiable certificates and the authentication attempt of the terminal creating a digital signature for the TOE challenge.

FCS_COP.1/CA_MAC Cryptographic operation – MAC

Hierarchical to: No other components.

Dependencies: [FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or
FCS_CKM.1 Cryptographic key generation]
FCS_CKM.4 Cryptographic key destruction

FCS_COP.1.1/ CA_MAC: The TSF shall perform secure messaging – message authentication code [13] in accordance with a specified cryptographic algorithm [assignment: *cryptographic algorithm*] and cryptographic key sizes [assignment: *cryptographic key sizes*] that meet the following: [assignment: *list of standards*].

Application note 18: This SFR requires the TOE to implement the cryptographic primitive for secure messaging with encryption and message authentication code over the transmitted data. The key is agreed between the TSF by Chip Authentication Protocol Version 1 according to the FCS_CKM.1/CA. Furthermore the SFR is used for authentication attempts of a terminal as Personalisation Agent by means of the authentication mechanism.

6.1.2 Class FIA Identification and Authentication

Application note 19: The Table 5 provides an overview on the authentication mechanisms used.

12 [assignment: *list of cryptographic operations*]

13 [assignment: *list of cryptographic operations*]

Name	SFR for the TOE
Authentication Mechanism for Personalisation Agents	FIA_UAU.4/PACE
Chip Authentication Protocol v.1	FIA_API.1, FIA_UAU.5/PACE, FIA_UAU.6/EAC
Terminal Authentication Protocol v.1	FIA_UAU.5/PACE
PACE protocol[14]	*FIA_UAU.1/PACE* *FIA_UAU.5/PACE* *FIA_AFL.1/PACE*
Passive Authentication	FIA_UAU.5/PACE

Table 5: Overview on authentication SFR

785 Note the Chip Authentication Protocol Version 1 as defined in this protection profile includes

- the asymmetric key agreement to establish symmetric secure messaging keys between the TOE and the terminal based on the Chip Authentication Public Key and the Terminal Public Key used later in the Terminal Authentication Protocol Version 1,
- the check whether the TOE is able to generate the correct message authentication code
790 with the expected key for any message received by the terminal.

The Chip Authentication Protocol v.1 may be used independent of the Terminal Authentication Protocol v.1. But if the Terminal Authentication Protocol v.1 is used the terminal shall use the same public key as presented during the Chip Authentication Protocol v.1.

The TOE shall meet the requirement “Timing of identification (FIA_UID.1)” as specified
795 below (Common Criteria Part 2).

FIA_UID.1/PACE Timing of identification

Hierarchical to: No other components.

Dependencies: No dependencies.

FIA_UID.1.1/PACE The TSF shall allow

1. to establish the communication channel,
2. carrying out the PACE Protocol according to [4],
3. to read the Initialization Data if it is not disabled by TSF according to FMT_MTD.1/INI_DIS
4. to carry out the Chip Authentication Protocol v.1 according to [5]
5. to carry out the Terminal Authentication Protocol v.1

14 Only listed for information purposes

	according to [5][15] 6. [assignment: *list of TSF-mediated actions*]. on behalf of the user to be performed before the user is identified.
FIA_UID.1.2/PACE	The TSF shall require each user to be successfully identified before allowing any other TSF-mediated actions on behalf of that user.

Application note 20: The SFR FIA_UID.1/PACE in the current PP covers the definition in PACE PP [7] and extends it by EAC aspect 4. This extension does not conflict with the strict conformance to PACE PP.

Application note 21: In the Phase 2 "Manufacturing of the TOE" the Manufacturer is the only user role known to the TOE which writes the Initialization Data and/or Pre-personalisation Data in the audit records of the IC. The travel document manufacturer may create the user role Personalisation Agent for transition from Phase 2 to Phase 3 "Personalisation of the travel document". The users in role Personalisation Agent identify themselves by means of selecting the authentication key. After personalisation in the Phase 3 the PACE domain parameters, the Chip Authentication data and Terminal Authentication Reference Data are written into the TOE. The Inspection System is identified as default user after power up or reset of the TOE i.e. the TOE will run the PACE protocol, to gain access to the Chip Authentication Reference Data and to run the Chip Authentication Protocol Version 1. After successful authentication of the chip the terminal may identify itself as (i) Extended Inspection System by selection of the templates for the Terminal Authentication Protocol Version 1 or (ii) if necessary and available by authentication as Personalisation Agent (using the Personalisation Agent Key).

Application note 22: User identified after a successfully performed PACE protocol is a terminal. Please note that neither CAN nor MRZ effectively represent secrets, but are restricted revealable; i.e. it is either the travel document holder itself or an authorised other person or device (Basic Inspection System with PACE).

Application note 23: In the life-cycle phase 'Manufacturing' the Manufacturer is the only user role known to the TOE. The Manufacturer writes the Initialisation Data and/or Pre-personalisation Data in the audit records of the IC.
Please note that a Personalisation Agent acts on behalf of the travel document Issuer under his and CSCA and DS policies. Hence, they define authentication procedure(s) for Personalisation Agents. The TOE must functionally support these authentication procedures being subject to evaluation within the assurance components ALC_DEL.1 and AGD_PRE.1. The TOE assumes the user role 'Personalisation Agent', when a terminal proves the respective Terminal Authorisation Level as defined by the related policy (policies).

The TOE shall meet the requirement "Timing of authentication (FIA_UAU.1)" as specified below (Common Criteria Part 2).

15 [assignment: *list of TSF-mediated actions*]

FIA_UAU.1/PACE Timing of authentication

Hierarchical to: No other components.

Dependencies: FIA_UID.1 Timing of identification.

FIA_UAU.1.1/PACE The TSF shall allow

1. to establish the communication channel,
2. carrying out the PACE Protocol according to [4],
3. to read the Initialization Data if it is not disabled by TSF according to FMT_MTD.1/INI_DIS,
4. to identify themselves by selection of the authentication key
5. to carry out the Chip Authentication Protocol Version 1 according to [5]
6. to carry out the Terminal Authentication Protocol Version 1 according to [5] [16]
7. [assignment: *list of TSF-mediated actions*]

on behalf of the user to be performed before the user is authenticated.

FIA_UAU.1.2/PACE The TSF shall require each user to be successfully authenticated before allowing any other TSF-mediated actions on behalf of that user.

Application note 24: The SFR FIA_UAU.1/PACE. in the current PP covers the definition in PACE PP [7] and extends it by EAC aspect 5. This extension does not conflict with the strict conformance to PACE PP.

Application note 25: The user authenticated after a successfully performed PACE protocol is a terminal. Please note that neither CAN nor MRZ effectively represent secrets, but are restricted revealable; i.e. it is either the travel document holder itself or an authorised other person or device (BIS-PACE).
If PACE was successfully performed, secure messaging is started using the derived session keys (PACE-K_{MAC}, PACE-K_{Enc}), cf. FTP_ITC.1/PACE.

The TOE shall meet the requirements of "Single-use authentication mechanisms (FIA_UAU.4)" as specified below (Common Criteria Part 2).

FIA_UAU.4/PACE Single-use authentication mechanisms - Single-use authentication of the Terminal by the TOE

Hierarchical to: No other components.

Dependencies: No dependencies.

16 [assignment: *list of TSF-mediated actions*]

FIA_UAU.4.1/PACE The TSF shall prevent reuse of authentication data related to

1. PACE Protocol according to [4],
2. Authentication Mechanism based on [selection: *Triple-DES, AES or other approved algorithms*]
3. Terminal Authentication Protocol v.1 according to [5],[17].

Application note 26: The SFR FIA_UAU.4.1 in the current PP covers the definition in PACE PP [7] and extends it by the EAC aspect 3. This extension does not conflict with the strict conformance to PACE PP. The generation of random numbers (random nonce) used for the authentication protocol (PACE) and Terminal Authentication as required by FIA_UAU.4/PACE is required by FCS_RND.1 from [7].

Application note 27: The authentication mechanisms may use either a challenge freshly and randomly generated by the TOE to prevent reuse of a response generated by a terminal in a successful authentication attempt. However, the authentication of Personalisation Agent may rely on other mechanisms ensuring protection against replay attacks, such as the use of an internal counter as a diversifier.

The TOE shall meet the requirement "Multiple authentication mechanisms (FIA_UAU.5)" as specified below (Common Criteria Part 2).

FIA_UAU.5/PACE Multiple authentication mechanisms

Hierarchical to: No other components.

Dependencies: No dependencies.

FIA_UAU.5.1/PACE The TSF shall provide

1. PACE Protocol according to [4],
2. Passive Authentication according to [6]
3. Secure messaging in MAC-ENC mode according to [4],
4. Symmetric Authentication Mechanism based on [selection: *Triple-DES, AES or other approved algorithms*]
5. Terminal Authentication Protocol v.1 according to [5],[18]

to support user authentication.

FIA_UAU.5.2/PACE The TSF shall authenticate any user's claimed identity according to the following rules:

1. Having successfully run the PACE protocol the TOE accepts only received commands with correct message authentication code sent by means of secure messaging with the key agreed with the terminal by means of the PACE protocol.

17 [assignment: *identified authentication mechanism(*s)]

18 [assignment: *list of multiple authentication mechanisms*]

2. The TOE accepts the authentication attempt as Personalisation Agent by [selection: *the Authentication Mechanism with Personalisation Agent Key(s)*].
3. After run of the Chip Authentication Protocol Version 1 the TOE accepts only received commands with correct message authentication code sent by means of secure messaging with key agreed with the terminal by means of the Chip Authentication Mechanism v1.
4. The TOE accepts the authentication attempt by means of the Terminal Authentication Protocol v.1 only if the terminal uses the public key presented during the Chip Authentication Protocol v.1 and the secure messaging established by the Chip Authentication Mechanism v.1[19].
5. [assignment: *rules describing how the multiple authentication mechanisms provide authentication*]

Application note 28: The SFR FIA_UAU.5.1/PACE in the current PP covers the definition in PACE PP [7] and extends it by EAC aspects 4), 5), and 6). The SFR FIA_UAU.5.2/PACE in the current PP covers the definition in PACE PP [7] and extends it by EAC aspects 2), 3), 4) and 5). These extensions do not conflict with the strict conformance to PACE PP.

The TOE shall meet the requirement "Re-authenticating (FIA_UAU.6)" as specified below (Common Criteria Part 2).

FIA_UAU.6/EAC Re-authenticating – Re-authenticating of Terminal by the TOE

Hierarchical to: No other components.

Dependencies: No dependencies.

FIA_UAU.6.1/EAC The TSF shall re-authenticate the user under the conditions each command sent to the TOE after successful run of the Chip Authentication Protocol Version 1 shall be verified as being sent by the Inspection System.[20]

Application note 29: The Password Authenticated Connection Establishment and the Chip Authentication Protocol specified in [6] include secure messaging for all commands exchanged after successful authentication of the Inspection System. The TOE checks by secure messaging in MAC_ENC mode each command based on a corresponding MAC algorithm whether it was sent by the successfully authenticated terminal (see FCS_COP.1/CA_MAC for further details). The TOE does not execute any command with incorrect message authentication code. Therefore the TOE re-authenticates the user for each received command and accepts only those commands received from the previously authenticated user.

The TOE shall meet the requirement "Authentication Proof of Identity (FIA_API.1)" as specified below (Common Criteria Part 2 extended).

19 [assignment: *rules describing how the multiple authentication mechanisms provide authentication*]

20 [assignment: *list of conditions under which re-authentication is required*]

FIA_API.1 Authentication Proof of Identity

Hierarchical to: No other components.

Dependencies: No dependencies.

FIA_API.1.1 The TSF shall provide a Chip Authentication Protocol Version 1 according to [5] [21] to prove the identity of the TOE [22].

Application note 30: This SFR requires the TOE to implement the Chip Authentication Mechanism v.1 specified in [5]. The TOE and the terminal generate a shared secret using the Diffie-Hellman Protocol (DH or EC-DH) and two session keys for secure messaging in ENC_MAC mode according to [6]. The terminal verifies by means of secure messaging whether the travel document's chip was able or not to run his protocol properly using its Chip Authentication Private Key corresponding to the Chip Authentication Key (EF.DG14).

6.1.3 Class FDP User Data Protection

The TOE shall meet the requirement "Subset access control (FDP_ACC.1)" as specified below (Common Criteria Part 2).

FDP_ACC.1/TRM Subset access control

Hierarchical to: No other components.

Dependencies: FDP_ACF.1 Security attribute based access control

FDP_ACC.1.1/TRM The TSF shall enforce the Access Control SFP [23] on terminals gaining access to the User Data and data stored in EF.SOD of the logical travel document [24]

Application note 31: The SFR FIA_ACC.1.1 in the current PP covers the definition in PACE PP [7] and extends it by data stored in EF.SOD of the logical travel document. This extension does not conflict with the strict conformance to PACE PP.

The TOE shall meet the requirement "Security attribute based access control (FDP_ACF.1)" as specified below (Common Criteria Part 2).

FDP_ACF.1/TRM Security attribute based access control

Hierarchical to: No other components.

Dependencies: FDP_ACC.1 Subset access control

21 [assignment: *authentication mechanism*]

22 [assignment: *authorized user or role*]

23 [assignment: *access control SFP*]

24 [assignment: *list of subjects*, *objects, and operations among subjects and objects covered by the SFP*]

905 FMT_MSA.3 Static attribute initialization

FDP_ACF.1.1/TRM The TSF shall enforce the Access Control SFP[25] to objects based on the following:

1. Subjects:
   a. Terminal,
   b. BIS-PACE
   c. Extended Inspection System
2. Objects:
   a. data in EF.DG1, EF.DG2 and EF.DG5 to EF.DG16, EF.SOD and EF.COM of the logical travel document,
   b. data in EF.DG3 of the logical travel document,
   c. data in EF.DG4 of the logical travel document,
   d. all TOE intrinsic secret cryptographic keys stored in the travel document[26]
3. Security attributes:
   a. PACE Authentication
   b. Terminal Authentication v.1
   c. Authorisation of the Terminal [27].

FDP_ACF.1.2/TRM The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed: A BIS-PACE is allowed to read data objects from FDP_ACF.1.1/TRM according to [4] after a successful PACE authentication as required by FIA_UAU.1/PACE.[28].

FDP_ACF.1.3/TRM The TSF shall explicitly authorize access of subjects to objects based on the following additional rules: none[29].

FDP_ACF.1.4/TRM The TSF shall explicitly deny access of subjects to objects based on the following additional rules:

1. Any terminal being not authenticated as PACE authenticated BIS-PACE is not allowed to read, to write, to modify, to use any User Data stored on the travel document.
2. Terminals not using secure messaging are not allowed to read, to write, to modify, to use any data stored on the travel document.

25 [assignment: *access control SFP*]

26 e.g. Chip Authentication Version 1 and ephemeral keys

27 [assignment: *list of subjects and objects controlled under the indicated SFP, and. for each, the SFP-relevant security attributes*, *or named groups of SFP-relevant security attributes*]

28 [assignment: *rules governing access among controlled subjects and controlled objects using controlled operations on controlled objects*]

29 [assignment: *rules, based on security attributes, that explicitly authorise access of subjects to objects*]

3. Any terminal being not successfully authenticated as Extended Inspection System with the Read access to DG 3 (Fingerprint) granted by the relative certificate holder authorization encoding is not allowed to read the data objects 2b) of FDP_ACF.1.1/TRM.
4. Any terminal being not successfully authenticated as Extended Inspection System with the Read access to DG 4 (Iris) granted by the relative certificate holder authorization encoding is not allowed to read the data objects 2c) of FDP_ACF.1.1/TRM.
5. Nobody is allowed to read the data objects 2d) of FDP_ACF.1.1/TRM.
6. Terminals authenticated as CVCA or as DV are not allowed to read data in the EF.DG3 and EF.DG4[30].

Application note 32: The SFR FDP_ACF.1.1/TRM in the current PP covers the definition in PACE PP [7] and extends it by additional subjects and objects. The SFRs FDP_ACF.1.2/TRM and FDP_ACF.1.3/TRM in the current PP cover the definition in PACE PP [7]. The SFR FDP_ACF.1.4/TRM in the current PP covers the definition in PACE PP [7] and extends it by 3) to 6).These extensions do not conflict with the strict conformance to PACE PP.

Application note 33: The relative certificate holder authorization encoded in the CVC of the inspection system is defined in [5]. The TOE verifies the certificate chain established by the Country Verifying Certification Authority, the Document Verifier Certificate and the Inspection System Certificate (cf. FMT_MTD.3). The Terminal Authorization is the intersection of the Certificate Holder Authorization in the certificates of the Country Verifying Certification Authority, the Document Verifier Certificate and the Inspection System Certificate in a valid certificate chain.

Application note 34: Please note that the Document Security Object (SO_D) stored in EF.SOD (see [6]) does not belong to the user data, but to the TSF data. The Document Security Object can be read out by Inspection Systems using PACE, see [4].

Application note 35: FDP_UCT.1/TRM and FDP_UIT.1/TRM require the protection of the User Data transmitted from the TOE to the terminal by secure messaging with encryption and message authentication codes after successful Chip Authentication Version 1 to the Inspection System. The Password Authenticated Connection Establishment, and the Chip Authentication Protocol v.1 establish different key sets to be used for secure messaging (each set of keys for the encryption and the message authentication key).

6.1.4 Class FMT Security Management

Application note 36: The SFR FMT_SMR.1/PACE provides basic requirements to the management of the TSF data.

30 [assignment: *rules, based on security attributes, that explicitly authorise access of subjects to objects*]

930 The TOE shall meet the requirement “Security roles (FMT_SMR.1)” as specified below (Common Criteria Part 2).

FMT_SMR.1/PACE Security roles

Hierarchical to: No other components.

Dependencies: FIA_UID.1 Timing of identification.

FMT_SMR.1.1/PACE The TSF shall maintain the roles

1. Manufacturer,
2. Personalisation Agent,
3. Terminal,
4. PACE authenticated BIS-PACE,
5. Country Verifying Certification Authority,
6. Document Verifier,
7. Domestic Extended Inspection System
8. Foreign Extended Inspection System [31].

FMT_SMR.1.2/PACE The TSF shall be able to associate users with roles.

935 **Application note 37:** The SFR FMT_SMR.1.1/PACE in the current PP covers the definition in PACE PP [7] and extends it by 5) to 8). This extension does not conflict with the strict conformance to PACE PP.

Application note 38: The SFR FMT_LIM.1 and FMT_LIM.2 address the management of the TSF and TSF data to prevent misuse of test features of the TOE over the life-cycle phases.

940 The TOE shall meet the requirement “Limited capabilities (FMT_LIM.1)” as specified below (Common Criteria Part 2 extended).

FMT_LIM.1 Limited capabilities

Hierarchical to: No other components.

Dependencies: FMT_LIM.2 Limited availability.

31 [assignment: *the authorised identified roles*]

FMT_LIM.1.1 The TSF shall be designed in a manner that limits their capabilities so that in conjunction with "Limited availability (FMT_LIM.2)" the following policy is enforced:
Deploying Test Features after TOE Delivery does not allow,

1. User Data to be manipulated and disclosed,
2. TSF data to be disclosed or manipulated,
3. software to be reconstructed,
4. substantial information about construction of TSF to be gathered which may enable other attacks and
5. sensitive User Data (EF.DG3 and EF.DG4) to be disclosed,[32].

945 The TOE shall meet the requirement "Limited availability (FMT_LIM.2)" as specified below (Common Criteria Part 2 extended).

FMT_LIM.2 Limited availability

Hierarchical to: No other components.

Dependencies: FMT_LIM.1 Limited capabilities.

FMT_LIM.2.1 The TSF shall be designed in a manner that limits their availability so that in conjunction with "Limited capabilities (FMT_LIM.1)" the following policy is enforced:

Deploying Test Features after TOE Delivery does not allow:

1. User Data to be manipulated and disclosed,
2. TSF data to be disclosed or manipulated
3. software to be reconstructed,
4. substantial information about construction of TSF to be gathered which may enable other attacks and
5. sensitive User Data (EF.DG3 and EF.DG4) to be disclosed,[33].

950 **Application note 39:** The formulation of "Deploying Test Features …" in FMT_LIM.2.1 might be a little bit misleading since the addressed features are no longer available (e.g. by disabling or removing the respective functionality). Nevertheless the combination of FMT_LIM.1 and FMT_LIM.2 is introduced to provide an optional approach to enforce the same policy.

955 Note that the term "software" in item 4 of FMT_LIM.1.1 and FMT_LIM.2.1 refers to both IC Dedicated and IC Embedded Software.

Application note 40: The following SFR are iterations of the component Management of TSF data (FMT_MTD.1). The TSF data include but are not limited to those identified below.

The TOE shall meet the requirement "Management of TSF data (FMT_MTD.1)" as specified
960 below (Common Criteria Part 2). The iterations address different management functions and

32 [assignment: *Limited capability and availability policy*]

33 [assignment: *Limited capability and availability policy*]

different TSF data.

FMT_MTD.1/CVCA_INI Management of TSF data – Initialization of CVCA Certificate and Current Date

Hierarchical to: No other components.

965 Dependencies: FMT_SMF.1 Specification of management functions
FMT_SMR.1 Security roles

FMT_MTD.1.1/ CVCA_INI The TSF shall restrict the ability to write [34] the
1. initial Country Verifying Certification Authority Public Key,
2. initial Country Verifying Certification Authority Certificate,
3. initial Current Date,
4. [assignment: *list of TSF data*] [35]

to [assignment: *the authorised identified roles*].

Application note 41: The ST writer shall perform the missing operation in the component FMT_MTD.1.1/CVCA_INI. The initial Country Verifying Certification Authority Public Key may be written by the Manufacturer in the production or pre-personalisation phase or by the
970 Personalisation Agent (cf. [5]). The initial Country Verifying Certification Authority Public Keys (and their updates later on) are used to verify the Country Verifying Certification Authority Link-Certificates. The initial Country Verifying Certification Authority Certificate and the initial Current Date is needed for verification of the certificates and the calculation of the Terminal Authorization.

975 **FMT_MTD.1/CVCA_UPD Management of TSF data – Country Verifying Certification Authority**

Hierarchical to: No other components.

Dependencies: FMT_SMF.1 Specification of management functions
FMT_SMR.1 Security roles

FMT_MTD.1.1/ CVCA_UPD The TSF shall restrict the ability to update [36] the
1. Country Verifying Certification Authority Public Key,
2. Country Verifying Certification Authority Certificate [37]

to Country Verifying Certification Authority [38].

980 **Application note 42:** The Country Verifying Certification Authority updates its asymmetric key pair and distributes the public key be means of the Country Verifying CA Link-Certificates

34 [selection: *change_default, query, modify, delete, clear*, [assignment: *other operations*]]

35 [assignment: *list of TSF data*]

36 [selection: *change_default, query, modify, delete, clear*, [assignment: *other operations*]]

37 [assignment: *list of TSF data*]

38 [assignment: *the authorised identified roles*]

(cf. [5]). The TOE updates its internal trust-point if a valid Country Verifying CA Link-Certificates (cf. FMT_MTD.3) is provided by the terminal (cf. [5]).

FMT_MTD.1/DATE Management of TSF data – Current date

Hierarchical to: No other components.

Dependencies: FMT_SMF.1 Specification of management functions
FMT_SMR.1 Security roles

FMT_MTD.1.1/ DATE: The TSF shall restrict the ability to modify [39] the Current date [40] to
1. Country Verifying Certification Authority,
2. Document Verifier,
3. Domestic Extended Inspection System [41].

Application note 43: The authorized roles are identified in their certificate (cf. [5]) and authorized by validation of the certificate chain (cf. FMT_MTD.3). The authorized role of the terminal is part of the Certificate Holder Authorization in the card verifiable certificate provided by the terminal for the identification and the Terminal Authentication v.1 (cf. to [5]).

FMT_MTD.1/CAPK Management of TSF data – Chip Authentication Private Key

Hierarchical to: No other components.

Dependencies: FMT_SMF.1 Specification of management functions
FMT_SMR.1 Security roles

FMT_MTD.1.1/ CAPK: The TSF shall restrict the ability to [selection: *create, load*][42] the Chip Authentication Private Key [43] to [assignment: *the authorised identified roles*].

Application note 44: The component FMT_MTD.1/CAPK is refined by (i) selecting other operations and (ii) defining a selection for the operations “create” and “load” to be performed by the ST writer. The verb “load” means here that the Chip Authentication Private Key is generated securely outside the TOE and written into the TOE memory. The verb “create” means here that the Chip Authentication Private Key is generated by the TOE itself. In the latter case the ST writer shall include an appropriate instantiation of the component FCS_CKM.1/CA as SFR for this key generation. The ST writer shall perform the assignment for the authorized identified roles in the SFR component FMT_MTD.1/CAPK.

39 [selection: *change_default, query, modify, delete, clear*, [assignment: *other operations*]]

40 [assignment: *list of TSF data*]

41 [assignment: *the authorised identified roles*]

42 [selection: *change_default, query, modify, delete, clear*, [assignment: *other operations*]]

43 [assignment: *list of TSF data*]

FMT_MTD.1/KEY_READ Management of TSF data – Key Read

Hierarchical to: No other components.

Dependencies: FMT_SMF.1 Specification of management functions
FMT_SMR.1 Security roles

FMT_MTD.1.1/ KEY_READ: The TSF shall restrict the ability to read [44] the
1. PACE passwords,
2. Chip Authentication Private Key,
3. Personalisation Agent Keys [45]

to none [46].

Application note 45: The SFR FMT_MTD.1/KEY_READ in the current PP covers the definition in PACE PP [7] and extends it by additional TSF data. This extension does not conflict with the strict conformance to PACE PP.

The TOE shall meet the requirement "Secure TSF data (FMT_MTD.3)" as specified below (Common Criteria Part 2):

FMT_MTD.3 Secure TSF data

Hierarchical to: No other components.

Dependencies: FMT_MTD.1 Management of TSF data

FMT_MTD.3.1 The TSF shall ensure that only secure values **of the certificate chain** are accepted for TSF data of the Terminal Authentication Protocol v.1 and the Access Control[47].

Refinement: The certificate chain is valid if and only if

1 the digital signature of the Inspection System Certificate can be verified as correct with the public key of the Document Verifier Certificate and the expiration date of the Inspection System Certificate is not before the Current Date of the TOE,

2 the digital signature of the Document Verifier Certificate can be verified as correct with the public key in the Certificate of the Country Verifying Certification Authority and the expiration date of the Document Verifier Certificate is not before the Current Date of the TOE,

3 the digital signature of the Certificate of the Country Verifying Certification Authority can be verified as correct with the public key of the Country Verifying Certification Authority known to the TOE and the expiration date of the Certificate

44 [selection: *change_default, query, modify, delete, clear*, [assignment: *other operations*]]

45 [assignment: *list of TSF data*]

46 [assignment: *the authorised identified roles*]

47 [assignment: list of TSF data]

of the Country Verifying Certification Authority is not before the Current Date of the TOE.

The Inspection System Public Key contained in the Inspection System Certificate in a valid certificate chain is a secure value for the authentication reference data of the Extended Inspection System.

The intersection of the Certificate Holder Authorizations contained in the certificates of a valid certificate chain is a secure value for Terminal Authorization of a successful authenticated Extended Inspection System.

Application note 46: The Terminal Authentication Version 1 is used for Extended Inspection System as required by FIA_UAU.4/PACE and FIA_UAU.5/PACE. The Terminal Authorization is used as TSF data for access control required by FDP_ACF.1/TRM.

6.1.5 Class FPT Protection of the Security Functions

The TOE shall prevent inherent and forced illicit information leakage for User Data and TSF Data. The security functional requirement FPT_EMS.1 addresses the inherent leakage. The SFRs "Limited capabilities (FMT_LIM.1)", "Limited availability (FMT_LIM.2)" together with the SAR "Security architecture description" (ADV_ARC.1) prevent bypassing, deactivation and manipulation of the security features or misuse of TOE functions.

The TOE shall meet the requirement "TOE Emanation (FPT_EMS.1)" as specified below (Common Criteria Part 2 extended):

FPT_EMS.1 TOE Emanation

Hierarchical to: No other components.

Dependencies: No Dependencies.

FPT_EMS.1.1 The TOE shall not emit [*assignment: types of emissions*] in excess of [assignment: *specified limits*] enabling access to

1. Chip Authentication Session Keys
2. PACE session Keys (PACE-K_{MAC}, PACE-K_{Enc}),
3. the ephemeral private key ephem SK_{PICC}-PACE,
4. [assignment: *list of types of TSF data*],
5. Personalisation Agent Key(s),
6. Chip Authentication Private Key [48] and
7. [assignment: list of types of user data].

48 [assignment: *list of types of TSF data*]

FPT_EMS.1.2 The TSF shall ensure any users [49] are unable to use the following interface smart card circuit contacts [50] to gain access to

1. Chip Authentication Session Keys
2. PACE Session Keys (PACE-K_{MAC}, PACE-K_{Enc}),
3. the ephemeral private key ephem SK_{PICC}-PACE,
4. [assignment: *list of types of TSF data*],
5. Personalisation Agent Key(s) and
6. Chip Authentication Private Key [51] and
7. [assignment: *list of types of user data*].

Application note 47: The SFR FPT_EMS.1.1 in the current PP covers the definition in PACE PP [7] and extends it by EAC aspects 1., 5. and 6. The SFR FPT_EMS.1.2 in the current PP covers the definition in PACE PP [7] and extends it by EAC aspects 4) and 5). These extensions do not conflict with the strict conformance to PACE PP.

Application note 48: The ST writer shall perform the operation in FPT_EMS.1.1 and FPT_EMS.1.2. The TOE shall prevent attacks against the listed secret data where the attack is based on external observable physical phenomena of the TOE. Such attacks may be observable at the interfaces of the TOE or may be originated from internal operation of the TOE or may be caused by an attacker that varies the physical environment under which the TOE operates. The set of measurable physical phenomena is influenced by the technology employed to implement the smart card. The travel document's chip can provide a smart card contactless interface and contact based interface according to ISO/IEC 7816-2 [14] as well (in case the package only provides a contactless interface the attacker might gain access to the contacts anyway). Examples of measurable phenomena include, but are not limited to variations in the power consumption, the timing of signals and the electromagnetic radiation due to internal operations or data transmissions.

The following security functional requirements address the protection against forced illicit information leakage including physical manipulation.

6.2 Security Assurance Requirements for the TOE

The assurance requirements for the evaluation of the TOE and its development and operating environment are those taken from the

Evaluation Assurance Level 4 (EAL4)

and augmented by taking the following components:

49 [assignment: *type of users*]

50 [assignment: *type of connection*]

51 [assignment: *list of types of TSF data*]

ALC_DVS.2, ATE_DPT.2 and AVA_VAN.5.

Application note 49: The TOE shall protect the assets against high attack potential. This includes intermediate storage in the chip as well as secure channel communications established using the Chip Authentication Protocol v.1 (OE.Prot_Logical_Travel_Document). If the TOE is operated in non-certified mode using the BAC-established communication channel, the confidentiality of the standard data shall be protected against attackers with at least Enhanced-Basic attack potential (AVA_VAN.3).

6.3 Security Requirements Rationale

6.3.1 Security Functional Requirements Rationale

The following table provides an overview for security functional requirements coverage.

	OT.Sens_Data_Conf	OT.Chip_Auth_Proof	*OT.AC_Pers*[52]	*OT.Data_Integrity*	*OT.Data_Authenticity*	*OT.Data_Confidentiality*	*OT.Identification*	*OT.Prot_Abuse-Func*	*OT.Prot_Inf_Leak*	*OT.Tracing*	*OT.Prot_Phys-Tamper*	*OT.Prot_Malfuntion*
FAU_SAS.1[53]			x				x					
FCS_CKM.1/DH_PACE				x	x	x						
FCS_CKM.1/CA	x	x	x	x	x	x						
FCS_CKM.4	x		x	x	x	x						
FCS_COP.1/PACE_ENC						x						
FCS_COP.1/CA_ENC	x	x	x	x		x						
FCS_COP.1/PACE_MAC				x	x							
FCS_COP.1/CA_MAC	x	x	x	x								
FCS_COP.1/SIG_VER	x		x									
FCS_RND.1	x		x	x	x	x						
FIA_AFL.1/PACE										x		
FIA_UID.1/PACE[54]	x		x	x	x	x						
FIA_UAU.1/PACE	x		x	x	x	x						
FIA_UAU.4/PACE	x		x	x	x	x						

52 SFRs and security objectives from PACE PP [7] are marked in italic letters.

53 SFRs and security objectives from PACE PP [7] are marked in italic letters.

54 SFRs from PACE PP [7] which are extended in EAC PP are marked in bold letters

	OT.Sens_Data_Conf	OT.Chip_Auth_Proof	*OT.AC_Pers*	*OT.Data_Integrity*	*OT.Data_Authenticity*	*OT.Data_Confidentiality*	*OT.Identification*	*OT.Prot_Abuse-Func*	*OT.Prot_Inf_Leak*	*OT.Tracing*	*OT.Prot_Phys-Tamper*	*OT.Prot_Malfuntion*
FIA_UAU.5/PACE	x		x	x	x	x						
FIA_UAU.6/PACE				x	x	x						
FIA_UAU.6/EAC	x		x	x	x	x						
FIA_API.1		x										
FDP_ACC.1/TRM	x		x	x		x						
FDP_ACF.1/TRM	x		x	x		x						
FDP_RIP.1				x	x	x						
FDP_UCT.1/TRM	x			x		x						
FDP_UIT.1/TRM				x		x						
FMT_SMF.1		x	x	x	x	x	x					
FMT_SMR.1/PACE		x	x	x	x	x	x					
FMT_LIM.1								x				
FMT_LIM.2								x				
FMT_MTD.1/INI_ENA			x				x					
FMT_MTD.1/INI_DIS			x				x					
FMT_MTD.1/CVCA_INI	x											
FMT_MTD.1/CVCA_UPD	x											
FMT_MTD.1/DATE	x											
FMT_MTD.1/CAPK	x	x		x								
FMT_MTD.1/PA			x	x	x	x						
FMT_MTD.1/KEY_READ	x	x	x	x	x	x						
FMT_MTD.3	x											
FPT_EMS.1			x						x			
FPT_TST.1									x			x
FPT_FLS.1									x			x
FPT_PHP.3				x					x		x	
FTP_ITC.1/PACE				x	x	x				x		

Table 6: Coverage of Security Objective for the TOE by SFR

The security objective **OT.Identification** "Identification of the TOE" addresses the storage of Initialisation and Pre-Personalisation Data in its non-volatile memory, whereby they also include the IC Identification Data uniquely identifying the TOE's chip. This will be ensured by
1085 TSF according to SFR FAU_SAS.1. The SFR FMT_MTD.1/INI_ENA allows only the

Manufacturer to write Initialisation and Pre-personalisation Data (including the Personalisation Agent key). The SFR FMT_MTD.1/INI_DIS requires the Personalisation Agent to disable access to Initialisation and Pre-personalisation Data in the life cycle phase 'operational use'. The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support the functions and roles related.

The security objective **OT.AC_Pers** "Access Control for Personalisation of logical travel document" addresses the access control of the writing the logical travel document. The justification for the SFRs FAU_SAS.1, FMT_MTD.1/INI_ENA and FMT_MTD.1/INI_DIS arises from the justification for OT.Identification above with respect to the Pre-personalisation Data. The write access to the logical travel document data are defined by the SFR FIA_UID.1/PACE, FIA_UAU.1/PACE, FDP_ACC.1/TRM and FDP_ACF.1/TRM in the same way: only the successfully authenticated Personalisation Agent is allowed to write the data of the groups EF.DG1 to EF.DG16 of the logical travel document only once. FMT_MTD.1/PA covers the related property of OT.AC_Pers (writing SO_D and, in generally, personalisation data). The SFR FMT_SMR.1/PACE lists the roles (including Personalisation Agent) and the SFR FMT_SMF.1 lists the TSF management functions (including Personalisation). The SFRs FMT_MTD.1./KEY_READ and FPT_EMS.1 restrict the access to the Personalisation Agent Keys and the Chip Authentication Private Key.

The authentication of the terminal as Personalisation Agent shall be performed by TSF according to SFR FIA_UAU.4/PACE and FIA_UAU.5/PACE. If the Personalisation Terminal want to authenticate itself to the TOE by means of the Terminal Authentication Protocol v.1 (after Chip Authentication v.1) with the Personalisation Agent Keys the TOE will use TSF according to the FCS_RND.1 (for the generation of the challenge), FCS_CKM.1/CA (for the derivation of the new session keys after Chip Authentication v.1), and FCS_COP.1/CA_ENC and FCS_COP.1/CA_MAC (for the ENC_MAC_Mode secure messaging), FCS_COP.1/SIG_VER (as part of the Terminal Authentication Protocol v.1) and FIA_UAU.6/EAC (for the re-authentication). If the Personalisation Terminal wants to authenticate itself to the TOE by means of the Authentication Mechanism with Personalisation Agent Key the TOE will use TSF according to the FCS_RND.1 (for the generation of the challenge) and FCS_COP.1/CA_ENC (to verify the authentication attempt). The session keys are destroyed according to FCS_CKM.4 after use.

The security objective **OT.Data_Integrity** "Integrity of personal data" requires the TOE to protect the integrity of the logical travel document stored on the travel document's chip against physical manipulation and unauthorized writing. Physical manipulation is addressed by FPT_PHP.3. Logical manipulation of stored user data is addressed by (FDP_ACC.1/TRM, FDP_ACF.1/TRM): only the Personalisation Agent is allowed to write the data in EF.DG1 to EF.DG16 of the logical travel document (FDP_ACF.1.2/TRM, rule 1) and terminals are not allowed to modify any of the data in EF.DG1 to EF.DG16 of the logical travel document (cf. FDP_ACF.1.4/TRM). FMT_MTD.1/PA requires that SO_D containing signature over the User Data stored on the TOE and used for the Passive Authentication is allowed to be written by the Personalisation Agent only and, hence, is to be considered as trustworthy. The Personalisation Agent must identify and authenticate themselves according to FIA_UID.1/PACE and FIA_UAU.1/PACE before accessing these data. FIA_UAU.4/PACE, FIA_UAU.5/PACE and FCS_CKM.4 represent some required specific properties of the protocols used. The SFR FMT_SMR.1/PACE lists the roles and the SFR FMT_SMF.1 lists the TSF management functions.

Unauthorised modifying of the exchanged data is addressed, in the first line, by FTP_ITC.1/PACE using FCS_COP.1/PACE_MAC. For PACE secured data exchange, a prerequisite for establishing this trusted channel is a successful PACE Authentication (FIA_UID.1/PACE, FIA_UAU.1/PACE) using FCS_CKM.1/DH_PACE and possessing the special properties FIA_UAU.5/PACE, FIA_UAU.6/PACE resp. FIA_UAU.6/EAC. The trusted channel is established using PACE, Chip Authentication v.1, and Terminal Authentication v.1. FDP_RIP.1 requires erasing the values of session keys (here: for K_{MAC}).

The TOE supports the inspection system detect any modification of the transmitted logical travel document data after Chip Authentication v.1. The SFR FIA_UAU.6/EAC and FDP_UIT.1/TRM requires the integrity protection of the transmitted data after Chip Authentication v.1 by means of secure messaging implemented by the cryptographic functions according to FCS_CKM.1/CA (for the generation of shared secret andfor the derivation of the new session keys), and FCS_COP.1/CA_ENC and FCS_COP.1/CA_MAC for the ENC_MAC_Mode secure messaging. The session keys are destroyed according to FCS_CKM.4 after use.

The SFR FMT_MTD.1/CAPK and FMT_MTD.1/KEY_READ requires that the Chip Authentication Key cannot be written unauthorized or read afterwards. The SFR FCS_RND.1 represents a general support for cryptographic operations needed.

The security objective **OT.Data_Authenticity** aims ensuring authenticity of the User- and TSF data (after the PACE Authentication) by enabling its verification at the terminal-side and by an active verification by the TOE itself.
This objective is mainly achieved by FTP_ITC.1/PACE using FCS_COP.1/PACE_MAC. A prerequisite for establishing this trusted channel is a successful PACE or Chip and Terminal Authentication v.1 (FIA_UID.1/PACE, FIA_UAU.1/PACE) using FCS_CKM.1/DH_PACE resp. FCS_CKM.1/CA and possessing the special properties FIA_UAU.5/PACE, FIA_UAU.6/PACE resp. FIA_UAU.6/EAC. FDP_RIP.1 requires erasing the values of session keys (here: for KMAC).
FIA_UAU.4/PACE, FIA_UAU.5/PACE and FCS_CKM.4 represent some required specific properties of the protocols used. The SFR FMT_MTD.1./KEY_READ restricts the access to the PACE passwords and the Chip Authentication Private Key.
FMT_MTD.1/PA requires that SO_D containing signature over the User Data stored on the TOE and used for the Passive Authentication is allowed to be written by the Personalisation Agent only and, hence, is to be considered as trustworthy.
The SFR FCS_RND.1 represents a general support for cryptographic operations needed.
The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support the functions and roles related.

The security objective **OT.Data_Confidentiality** aims that the TOE always ensures confidentiality of the User- and TSF-data stored and, after the PACE Authentication resp. Chip Authentication, of these data exchanged.
This objective for the data stored is mainly achieved by (FDP_ACC.1/TRM, FDP_ACF.1/TRM). FIA_UAU.4/PACE, FIA_UAU.5/PACE and FCS_CKM.4 represent some required specific properties of the protocols used.
This objective for the data exchanged is mainly achieved by FDP_UCT.1/TRM, FDP_UIT.1/TRM and FTP_ITC.1/PACE using FCS_COP.1/PACE_ENC resp. FCS_COP.1/CA_ENC. A prerequisite for establishing this trusted channel is a successful PACE or Chip and Terminal Authentication v.1 (FIA_UID.1/PACE, FIA_UAU.1/PACE) using

FCS_CKM.1/DH_PACE resp. FCS_CKM.1/CA and possessing the special properties FIA_UAU.5/PACE, FIA_UAU.6/PACE resp. FIA_UAU.6/EAC. FDP_RIP.1 requires erasing the values of session keys (here: for K_{enc}). The SFR FMT_MTD.1./KEY_READ restricts the access to the PACE passwords and the Chip Authentication Private Key. FMT_MTD.1/PA requires that SO_D containing signature over the User Data stored on the TOE and used for the Passive Authentication is allowed to be written by the Personalisation Agent only and, hence, is to be considered trustworthy .
The SFR FCS_RND.1 represents the general support for cryptographic operations needed.
The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support the functions and roles related.

The security objective **OT.Sense_Data_Conf** "Confidentiality of sensitive biometric reference data" is enforced by the Access Control SFP defined in FDP_ACC.1/TRM and FDP_ACF.1/TRM allowing the data of EF.DG3 and EF.DG4 only to be read by successfully authenticated Extended Inspection System being authorized by a valid certificate according FCS_COP.1/SIG_VER.

The SFRs FIA_UID.1/PACE and FIA_UAU.1/PACE require the identification and authentication of the inspection systems. The SFR FIA_UAU.5/PACE requires the successful Chip Authentication (CA) v.1 before any authentication attempt as Extended Inspection System. During the protected communication following the CA v.1 the reuse of authentication data is prevented by FIA_UAU.4/PACE. The SFR FIA_UAU.6/EAC and FDP_UCT.1/TRM requires the confidentiality protection of the transmitted data after Chip Authentication v.1 by means of secure messaging implemented by the cryptographic functions according to FCS_RND.1 (for the generation of the terminal authentication challenge), FCS_CKM.1/CA (for the generation of shared secret and for the derivation of the new session keys), and FCS_COP.1/CA_ENC and FCS_COP.1/CA_MAC for the ENC_MAC_Mode secure messaging. The session keys are destroyed according to FCS_CKM.4 after use. The SFR FMT_MTD.1/CAPK and FMT_MTD.1/KEY_READ requires that the Chip Authentication Key cannot be written unauthorized or read afterwards.

To allow a verification of the certificate chain as in FMT_MTD.3 the CVCA's public key and certificate as well as the current date are written or update by authorized identified role as of FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD and FMT_MTD.1/DATE.

The security objective **OT.Chip_Auth_Proof** "Proof of travel document's chip authenticity" is ensured by the Chip Authentication Protocol v.1 provided by FIA_API.1 proving the identity of the TOE. The Chip Authentication Protocol v.1 defined by FCS_CKM.1/CA is performed using a TOE internally stored confidential private key as required by FMT_MTD.1/CAPK and FMT_MTD.1/KEY_READ. The Chip Authentication Protocol v.1 [5] requires additional TSF according to FCS_CKM.1/CA (for the derivation of the session keys), FCS_COP.1/CA_ENC and FCS_COP.1/CA_MAC (for the ENC_MAC_Mode secure messaging).
The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support the functions and roles related.

The security objective **OT.Prot_Abuse-Func** "Protection against Abuse of Functionality" is ensured by the SFR FMT_LIM.1 and FMT_LIM.2 which prevent misuse of test functionality of the TOE or other features which may not be used after TOE Delivery.

The security objective **OT.Prot_Inf_Leak** "Protection against Information Leakage" requires the TOE to protect confidential TSF data stored and/or processed in the travel document's chip

against disclosure

- by measurement and analysis of the shape and amplitude of signals or the time between events found by measuring signals on the electromagnetic field, power consumption, clock, or I/O lines which is addressed by the SFR FPT_EMS.1,

- by forcing a malfunction of the TOE which is addressed by the SFR FPT_FLS.1 and FPT_TST.1, and/or

- by a physical manipulation of the TOE which is addressed by the SFR FPT_PHP.3.

The security objective **OT.Tracing** aims that the TOE prevents gathering TOE tracing data by means of unambiguous identifying the travel document remotely through establishing or listening to a communication via the contactless interface of the TOE without a priori knowledge of the correct values of shared passwords (CAN, MRZ).
This objective is achieved as follows:
(i) while establishing PACE communication with CAN or MRZ (non-blocking authorisation data) – by FIA_AFL.1/PACE;
(ii) for listening to PACE communication (is of importance for the current PP, since SO_D is card-individual) – FTP_ITC.1/PACE.

The security objective **OT.Prot_Phys-Tamper** "Protection against Physical Tampering" is covered by the SFR FPT_PHP.3.

The security objective **OT.Prot_Malfunction** "Protection against Malfunctions" is covered by (i) the SFR FPT_TST.1 which requires self tests to demonstrate the correct operation and tests of authorized users to verify the integrity of TSF data and TSF code, and (ii) the SFR FPT_FLS.1 which requires a secure state in case of detected failure or operating conditions possibly causing a malfunction.

6.3.2 Dependency Rationale

The dependency analysis for the security functional requirements shows that the basis for mutual support and internal consistency between all defined functional requirements is satisfied. All dependencies between the chosen functional components are analysed, and non-dissolved dependencies are appropriately explained.

The Table 7 shows the dependencies between the SFR of the TOE.

SFR	Dependencies	Support of the Dependencies
FCS_CKM.1/CA	[FCS_CKM.2 Cryptographic key distribution or FCS_COP.1 Cryptographic operation], FCS_CKM.4 Cryptographic key destruction	Fulfilled by FCS_COP.1/CA_ENC, and FCS_COP.1/CA_MAC, Fulfilled by FCS_CKM.4 from [7]

SFR	Dependencies	Support of the Dependencies
FCS_CKM.4 from [7]	[FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation]	Fulfilled by FCS_CKM.1/DH_PACE from [7] and FCS_CKM.1/CA
FCS_COP.1/CA_ENC	[FDP_ITC.1 Import of user data without security attributes, FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation], FCS_CKM.4 Cryptographic key destruction	Fulfilled by FCS_CKM.1/CA, Fulfilled by FCS_CKM.4 from [7]
FCS_COP.1/CA_MAC	[FDP_ITC.1 Import of user data without security attributes, FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation], FCS_CKM.4 Cryptographic key destruction	Fulfilled by FCS_CKM.1/CA Fulfilled by FCS_CKM.4 from [7]
FCS_COP.1/SIG_VER	[FDP_ITC.1 Import of user data without security attributes, FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation], FCS_CKM.4 Cryptographic key destruction	Fulfilled by FCS_CKM.1/CA, Fulfilled by FCS_CKM.4 from [7]
FIA_UID.1/PACE	No dependencies	n.a.
FIA_UAU.1/PACE	FIA_UID.1 Timing of identfication	Fulfilled by FIA_UID.1/PACE
FIA_UAU.4/PACE	No dependencies	n.a.
FIA_UAU.5/PACE	No dependencies	n.a.
FIA_UAU.6/EAC	No dependencies	n.a.
FIA_API.1	No dependencies	n.a.

SFR	Dependencies	Support of the Dependencies
FDP_ACC.1/TRM	FDP_ACF.1 Security attribute based access control	Fulfilled by FDP_ACF.1/TRM
FDP_ACF.1/TRM	FDP_ACC.1 Subset access control, FMT_MSA.3 Static attribute initialization	Fulfilled by FDP_ACC.1/TRM, justification 1 for non-satisfied dependencies
FMT_SMR.1/PACE	FIA_UID.1 Timing of identification	Fulfilled by FIA_UID.1/PACE
FMT_LIM.1	FMT_LIM.2	Fulfilled by FMT_LIM.2
FMT_LIM.2	FMT_LIM.1	Fulfilled by FMT_LIM.1
FMT_MTD.1/CVCA_INI	FMT_SMF.1 Specification of management functions, FMT_SMR.1 Security roles	Fulfilled by FMT_SMF.1 from [7] Fulfilled by FMT_SMR.1/PACE
FMT_MTD.1/CVCA_UPD	FMT_SMF.1 Specification of management functions, FMT_SMR.1 Security roles	Fulfilled by FMT_SMF.1 from [7] Fulfilled by FMT_SMR.1/PACE
FMT_MTD.1/DATE	FMT_SMF.1 Specification of management functions, FMT_SMR.1 Security roles	Fulfilled by FMT_SMF.1 from [7] Fulfilled by FMT_SMR.1/PACE
FMT_MTD.1/CAPK	FMT_SMF.1 Specification of management functions, FMT_SMR.1 Security roles	Fulfilled by FMT_SMF.1 from [7] Fulfilled by FMT_SMR.1/PACE
FMT_MTD.1/ PA	FMT_SMF.1 Specification of management functions FMT_SMR.1 Security roles	Fulfilled by FMT_SMF.1 from [7] Fulfilled by FMT_SMR.1/PACE

SFR	Dependencies	Support of the Dependencies
FMT_MTD.3	FMT_MTD.1	Fulfilled by FMT_MTD.1/CVCA_INI and FMT_MTD.1/CVCA_UPD
FPT_EMS.1	No dependencies	n.a.

Table 7: Dependencies between the SFR for the TOE

Justification for non-satisfied dependencies between the SFR for TOE:

No. 1: The access control TSF according to FDP_ACF.1/TRM uses security attributes which are defined during the personalisation and are fixed over the whole life time of the TOE. No management of these security attribute (i.e. SFR FMT_MSA.1 and FMT_MSA.3) is necessary here.

6.3.3 Security Assurance Requirements Rationale

The EAL4 was chosen to permit a developer to gain maximum assurance from positive security engineering based on good commercial development practices which, though rigorous, do not require substantial specialist knowledge, skills, and other resources. EAL4 is the highest level at which it is likely to be economically feasible to retrofit to an existing product line. EAL4 is applicable in those circumstances where developers or users require a moderate to high level of independently assured security in conventional commodity TOEs and are prepared to incur sensitive security specific engineering costs.

The selection of the component ALC_DVS.2 provides a higher assurance of the security of the travel document's development and manufacturing especially for the secure handling of the travel document's material.

The selection of the component ATE_DPT.2 provides a higher assurance than the pre-defined EAL4 package due to requiring the functional testing of SFR-enforcing modules.

The selection of the component AVA_VAN.5 provides a higher assurance of the security by vulnerability analysis to assess the resistance to penetration attacks performed by an attacker possessing a high attack potential. This vulnerability analysis is necessary to fulfil the security objectives OT.Sens_Data_Conf and OT.Chip_Auth_Proof.

The component ALC_DVS.2 has no dependencies.

The component ATE_DPT.2 has the following dependencies:

- ADV_ARC.1 Security architecture description
- ADV_TDS.3 Basic modular design
- ADV_FUN.1 Functional testing

All of these are met or exceeded in the EAL4 assurance package.

The component AVA_VAN.5 has the following dependencies:

- ADV_ARC.1 Security architecture description
- ADV_FSP.4 Complete functional specification
- ADV_TDS.3 Basic modular design
- ADV_IMP.1 Implementation representation of the TSF
- AGD_OPE.1 Operational user guidance
- AGD_PRE.1 Preparative procedures

All of these are met or exceeded in the EAL4 assurance package.

6.3.4 Security Requirements – Mutual Support and Internal Consistency

The following part of the security requirements rationale shows that the set of security requirements for the TOE consisting of the security functional requirements (SFRs) and the security assurance requirements (SARs) together form a mutually supportive and internally consistent whole.

The analysis of the TOE´s security requirements with regard to their mutual support and internal consistency demonstrates:

The dependency analysis in section 6.3.2 Dependency Rationale for the security functional requirements shows that the basis for mutual support and internal consistency between all defined functional requirements is satisfied. All dependencies between the chosen functional components are analysed, and non-satisfied dependencies are appropriately explained.

All subjects and objects addressed by more than one SFR in sec. 6.1 are also treated in a consistent way: the SFRs impacting them do not require any contradictory property and behaviour of these ‘shared’ items.

The assurance class EAL4 is an established set of mutually supportive and internally consistent assurance requirements. The dependency analysis for the sensitive assurance components in section 6.3.3 Security Assurance Requirements Rationale shows that the assurance requirements are mutually supportive and internally consistent as all (sensitive) dependencies are satisfied and no inconsistency appears.

Inconsistency between functional and assurance requirements could only arise if there are functional-assurance dependencies which are not met, a possibility which has been shown not to arise in sections 6.3.2 Dependency Rationale and 6.3.3 Security Assurance Requirements Rationale. Furthermore, as also discussed in section 6.3.3 Security Assurance Requirements Rationale, the chosen assurance components are adequate for the functionality of the TOE. So the assurance requirements and security functional requirements support each other and there are no inconsistencies between the goals of these two groups of security requirements.

1310 7 Glossary and Acronyms

Term	Definition
Accurate Terminal Certificate	A Terminal Certificate is accurate, if the issuing Document Verifier is trusted by the travel document's chip to produce Terminal Certificates with the correct certificate effective date, see [5].
Advanced Inspection Procedure (with PACE)	A specific order of authentication steps between a travel document and a terminal as required by [4], namely (i) PACE, (ii) Chip Authentication v.1, (iii) Passive Authentication with SO_D and (iv) Terminal Authentication v.1. AIP can generally be used by EIS-AIP-PACE.
Agreement	This term is used in the current PP in order to reflect an appropriate relationship between the parties involved, but not as a legal notion.
Active Authentication	Security mechanism defined in [6] option by which means the travel document's chip proves and the inspection system verifies the identity and authenticity of the travel document's chip as part of a genuine travel document issued by a known State of Organisation.
Application note	Optional informative part of the PP containing sensitive supporting information that is considered relevant or useful for the construction, evaluation, or use of the TOE.
Audit records	Write-only-once non-volatile memory area of the travel document's chip to store the Initialization Data and Pre-personalisation Data.
Authenticity	Ability to confirm the travel document and its data elements on the travel document's chip were created by the issuing State or Organisation
Basic Access Control (BAC)	Security mechanism defined in [6] by which means the travel document's chip proves and the inspection system protects their communication by means of secure messaging with Document Basic Access Keys (see there).
Basic Inspection System with PACE protocol (BIS-PACE)	A technical system being used by an inspecting authority and operated by a governmental organisation (i.e. an Official Domestic or Foreign Document Verifier) and verifying the travel document presenter as the travel document holder (for ePassport: by comparing the real biometric data (face) of the travel document presenter with the stored biometric data (DG2) of the travel document holder). The Basic Inspection System with PACE is a PACE Terminal additionally supporting/applying the Passive Authentication protocol and is authorised by the travel document Issuer through the Document Verifier of receiving state to read a subset of data stored on the travel document.
Basic Inspection System (BIS)	An inspection system which implements the terminals part of the Basic Access Control Mechanism and authenticates itself to the travel document's chip using the Document Basic Access Keys derived from

Term	Definition
	the printed MRZ data for reading the logical travel document.
Biographic data (biodata).	The personalised details of the travel document holder of the document appearing as text in the visual and machine readable zones on the biographical data page of a travel document. [6]
Biometric reference data	Data stored for biometric authentication of the travel document holder in the travel document's chip as (i) digital portrait and (ii) optional biometric reference data.
Card Access Number (CAN)	Password derived from a short number printed on the front side of the data-page.
Certificate chain	A sequence defining a hierarchy certificates. The Inspection System Certificate is the lowest level, Document Verifier Certificate in between, and Country Verifying Certification Authority Certificates are on the highest level. A certificate of a lower level is signed with the private key corresponding to the public key in the certificate of the next higher level.
Counterfeit	An unauthorized copy or reproduction of a genuine security document made by whatever means. [6]
Country Signing CA Certificate (C_{CSCA})	Certificate of the Country Signing Certification Authority Public Key (K_{PuCSCA}) issued by Country Signing Certification Authority stored in the inspection system.
Country Signing Certification Authority (CSCA)	An organisation enforcing the policy of the travel document Issuer with respect to confirming correctness of user and TSF data stored in the travel document. The CSCA represents the country specific root of the PKI for the travel documents and creates the Document Signer Certificates within this PKI. The CSCA also issues the self-signed CSCA Certificate (CCSCA) having to be distributed by strictly secure diplomatic means, see. [6], 5.5.1. The Country Signing Certification Authority issuing certificates for Document Signers (cf. [6]) and the domestic CVCA may be integrated into a single entity, e.g. a Country Certification Authority. However, even in this case, separate key pairs must be used for different roles, see [5].
Country Verifying Certification Authority (CVCA)	An organisation enforcing the privacy policy of the travel document Issuer with respect to protection of user data stored in the travel document (at a trial of a terminal to get an access to these data). The CVCA represents the country specific root of the PKI for the terminals using it and creates the Document Verifier Certificates within this PKI. Updates of the public key of the CVCA are distributed in form of CVCA Link-Certificates, see [5].

Term	Definition
	Since the Standard Inspection Procedure does not imply any certificate-based terminal authentication, the current TOE cannot recognise a CVCS as a subject; hence, it merely represents an organizational entity within this PP. The Country Signing Certification Authority (CSCA) issuing certificates for Document Signers (cf. [6]) and the domestic CVCA may be integrated into a single entity, e.g. a Country Certification Authority. However, even in this case, separate key pairs must be used for different roles, see [5].
Current date	The maximum of the effective dates of valid CVCA, DV and domestic Inspection System certificates known to the TOE. It is used the validate card verifiable certificates.
CV Certificate	Card Verifiable Certificate according to [5].
CVCA link Certificate	Certificate of the new public key of the Country Verifying Certification Authority signed with the old public key of the Country Verifying Certification Authority where the certificate effective date for the new key is before the certificate expiration date of the certificate for the old key.
Document Basic Access Key Derivation Algorithm	The [6] describes the Document Basic Access Key Derivation Algorithm on how terminals may derive the Document Basic Access Keys from the second line of the printed MRZ data.
PACE passwords	Passwords used as input for PACE. This may either be the CAN or the SHA-1-value of the concatenation of Serial Number, Date of Birth and Date of Expiry as read from the MRZ, see [4],
Document Details Data	Data printed on and electronically stored in the travel document representing the document details like document type, issuing state, document number, date of issue, date of expiry, issuing authority. The document details data are less-sensitive data.
Document Security Object (SO_D)	A RFC3369 CMS Signed Data Structure, signed by the Document Signer (DS). Carries the hash values of the LDS Data Groups. It is stored in the travel document's chip. It may carry the Document Signer Certificate (C_{DS}). [6]
Document Signer (DS)	An organisation enforcing the policy of the CSCA and signing the Document Security Object stored on the travel document for passive authentication. A Document Signer is authorised by the national CSCA issuing the Document Signer Certificate (C_{DS}), see [5]and [6].

Term	Definition
	This role is usually delegated to a Personalisation Agent.
Document Verifier (DV)	An organisation enforcing the policies of the CVCA and of a Service Provider (here: of a governmental organisation / inspection authority) and managing terminals belonging together (e.g. terminals operated by a State's border police), by – inter alia – issuing Terminal Certificates. A Document Verifier is therefore a Certification Authority, authorised by at least the national CVCA to issue certificates for national terminals, see [5]. Since the Standard Inspection Procedure does not imply any certificate-based terminal authentication, the current TOE cannot recognise a DV as a subject; hence, it merely represents an organisational entity within this PP. There can be Domestic and Foreign DV: A domestic DV is acting under the policy of the domestic CVCA being run by the travel document Issuer; a foreign DV is acting under a policy of the respective foreign CVCA (in this case there shall be an appropriate agreement between the travel document Issuer und a foreign CVCA ensuring enforcing the travel document Issuer's privacy policy).[55] [56]
Eavesdropper	A threat agent with high attack potential reading the communication between the travel document's chip and the inspection system to gain the data on the travel document's chip.
Enrolment	The process of collecting biometric samples from a person and the subsequent preparation and storage of biometric reference templates representing that person's identity. [6]
Travel document (electronic)	The contact based or contactless smart card integrated into the plastic or paper, optical readable cover and providing the following application: ePassport.
ePassport application	A part of the TOE containing the non-executable, related user data (incl. biometric) as well as the data needed for authentication (incl. MRZ); this application is intended to be used by authorities, amongst other as a machine readable travel document (MRTD). See [5].
Extended Access Control	Security mechanism identified in [6] by which means the travel document's chip (i) verifies the authentication of the inspection systems authorized to read the optional biometric reference data, (ii) controls the access to the optional biometric reference data and (iii) protects the confidentiality and integrity of the optional biometric reference data during their transmission to the inspection system by secure messaging.

55 The form of such an agreement may be of formal and informal nature; the term 'agreement' is used in the current PP in order to reflect an appropriate relationship between the parties involved.

56 Existing of such an agreement may be technically reflected by means of issuing a CCVCA-F for the Public Key of the foreign CVCA signed by the domestic CVCA.

Term	Definition
Extended Inspection System (EIS)	A role of a terminal as part of an inspection system which is in addition to Basic Inspection System authorized by the issuing State or Organisation to read the optional biometric reference data and supports the terminals part of the Extended Access Control Authentication Mechanism.
Forgery	Fraudulent alteration of any part of the genuine document, e.g. changes to the biographical data or the portrait. [6]
Global Interoperability	The capability of inspection systems (either manual or automated) in different States throughout the world to exchange data, to process data received from systems in other States, and to utilize that data in inspection operations in their respective States. Global interoperability is a major objective of the standardized specifications for placement of both eye-readable and machine readable data in all travel documents. [6]
IC Dedicated Software	Software developed and injected into the chip hardware by the IC manufacturer. Such software might support special functionality of the IC hardware and be used, amongst other, for implementing delivery procedures between different players. The usage of parts of the IC Dedicated Software might be restricted to certain life phases.
IC Dedicated Support Software	That part of the IC Dedicated Software (refer to above) which provides functions after TOE Delivery. The usage of parts of the IC Dedicated Software might be restricted to certain phases.
IC Dedicated Test Software	That part of the IC Dedicated Software (refer to above) which is used to test the TOE before TOE Delivery but which does not provide any functionality thereafter.
IC Embedded Software	Software embedded in an IC and not being designed by the IC developer. The IC Embedded Software is designed in the design life phase and embedded into the IC in the manufacturing life phase of the TOE.
IC Identification Data	The IC manufacturer writes a unique IC identifier to the chip to control the IC as travel document material during the IC manufacturing and the delivery process to the travel document manufacturer.
Impostor	A person who applies for and obtains a document by assuming a false name and identity, or a person who alters his or her physical appearance to represent himself or herself as another person for the purpose of using that person’s document. [6]
Improperly documented person	A person who travels, or attempts to travel with: (a) an expired travel document or an invalid visa; (b) a counterfeit, forged or altered travel document or visa; (c) someone else’s travel document or visa; or (d) no travel document or visa, if required. [6]
Initialisation	Process of writing Initialisation Data (see below) to the TOE (cf. sec. 1.2, TOE life-cycle, Phase 2, Step 3).

Term	Definition
Initialisation Data	Any data defined by the TOE Manufacturer and injected into the non-volatile memory by the Integrated Circuits manufacturer (Phase 2). These data are for instance used for traceability and for IC identification as travel document's material (IC identification data).
Inspection	The act of a State examining an travel document presented to it by a traveller (the travel document holder) and verifying its authenticity. [6]
Inspection system (IS)	A technical system used by the border control officer of the receiving State (i) examining an travel document presented by the traveller and verifying its authenticity and (ii) verifying the traveller as travel document holder.
Integrated circuit (IC)	Electronic component(s) designed to perform processing and/or memory functions. The travel document's chip is an integrated circuit.
Integrity	Ability to confirm the travel document and its data elements on the travel document's chip have not been altered from that created by the issuing State or Organisation
Issuing Organisation	Organisation authorized to issue an official travel document (e.g. the United Nations Organization, issuer of the Laissez-passer). [6]
Issuing State	The Country issuing the travel document. [6]
Logical Data Structure (LDS)	The collection of groupings of Data Elements stored in the optional capacity expansion technology [6]. The capacity expansion technology used is the travel document's chip.
Logical travel document	Data of the travel document holder stored according to the Logical Data Structure [6] as specified by ICAO on the contact based/contactless integrated circuit. It presents contact based/contactless readable data including (but not limited to) 1. personal data of the travel document holder 2. the digital Machine Readable Zone Data (digital MRZ data, EF.DG1), 3. the digitized portraits (EF.DG2), 4. the biometric reference data of finger(s) (EF.DG3) or iris image(s) (EF.DG4) or both and 5. the other data according to LDS (EF.DG5 to EF.DG16). 6. EF.COM and EF.SOD
Machine readable travel document (MRTD)	Official document issued by a State or Organisation which is used by the holder for international travel (e.g. passport, visa, official document of identity) and which contains mandatory visual (eye readable) data and a separate mandatory data summary, intended for global use, reflecting essential data elements capable of being machine read. [6]

Term	Definition
Machine readable zone (MRZ)	Fixed dimensional area located on the front of the travel document or MRP Data Page or, in the case of the TD1, the back of the travel document, containing mandatory and optional data for machine reading using OCR methods. [6] The MRZ-Password is a restricted-revealable secret that is derived from the machine readable zone and may be used for PACE.
Machine-verifiable biometrics feature	A unique physical personal identification feature (e.g. an iris pattern, fingerprint or facial characteristics) stored on a travel document in a form that can be read and verified by machine. [6]
Manufacturer	Generic term for the IC Manufacturer producing integrated circuit and the travel document Manufacturer completing the IC to the travel document. The Manufacturer is the default user of the TOE during the manufacturing life phase. The TOE itself does not distinguish between the IC Manufacturer and travel document Manufacturer using this role Manufacturer.
Metadata of a CV Certificate	Data within the certificate body (excepting Public Key) as described in [5]. The metadata of a CV certificate comprise the following elements: - Certificate Profile Identifier, - Certificate Authority Reference, - Certificate Holder Reference, - Certificate Holder Authorisation Template, - Certificate Effective Date, - Certificate Expiration Date.
ePassport application	Non-executable data defining the functionality of the operating system on the IC as the travel document's chip. It includes • the file structure implementing the LDS [6], • the definition of the User Data, but does not include the User Data itself (i.e. content of EF.DG1 to EF.DG13, EF.DG16, EF.COM and EF.SOD) and • the TSF Data including the definition the authentication data but except the authentication data itself.
Optional biometric reference data	Data stored for biometric authentication of the travel document holder in the travel document's chip as (i) encoded finger image(s) (EF.DG3) or (ii) encoded iris image(s) (EF.DG4) or (iii) both. Note, that the European commission decided to use only fingerprint and not to use iris images as optional biometric reference data.
Passive	(i) verification of the digital signature of the Document Security Object

Term	Definition
authentication	and (ii) comparing the hash values of the read LDS data fields with the hash values contained in the Document Security Object.
Password Authenticated Connection Establishment (PACE)	A communication establishment protocol defined in [4],. The PACE Protocol is a password authenticated Diffie-Hellman key agreement protocol providing implicit password-based authentication of the communication partners (e.g. smart card and the terminal connected): i.e. PACE provides a verification, whether the communication partners share the same value of a password π). Based on this authentication, PACE also provides a secure communication, whereby confidentiality and authenticity of data transferred within this communication channel are maintained.
PACE Password	A password needed for PACE authentication, e.g. CAN or MRZ.
Personalisation	The process by which the Personalisation Data are stored in and unambiguously, inseparably associated with the travel document. This may also include the optional biometric data collected during the "Enrolment" (cf. sec. 1.2, TOE life-cycle, Phase 3, Step 6).
Personalisation Agent	An organisation acting on behalf of the travel document Issuer to personalise the travel document for the travel document holder by some or all of the following activities: (i) establishing the identity of the travel document holder for the biographic data in the travel document, (ii) enrolling the biometric reference data of the travel document holder, (iii) writing a subset of these data on the physical travel document (optical personalisation) and storing them in the travel document (electronic personalisation) for the travel document holder as defined in [5], (iv) writing the document details data, (v) writing the initial TSF data, (vi) signing the Document Security Object defined in [6] (in the role of DS). Please note that the role 'Personalisation Agent' may be distributed among several institutions according to the operational policy of the travel document Issuer. Generating signature key pair(s) is not in the scope of the tasks of this role.
Personalisation Data	A set of data incl. (i) individual-related data (biographic and biometric data) of the travel document holder, (ii) dedicated document details data and

Term	Definition
	(iii)dedicated initial TSF data (incl. the Document Security Object). Personalisation data are gathered and then written into the non-volatile memory of the TOE by the Personalisation Agent in the life-cycle phase card issuing.
Personalisation Agent Authentication Information	TSF data used for authentication proof and verification of the Personalisation Agent.
Personalisation Agent Key	Cryptographic authentication key used (i) by the Personalisation Agent to prove his identity and to get access to the logical travel document and (ii) by the travel document's chip to verify the authentication attempt of a terminal as Personalisation Agent according to the SFR FIA_UAU.4/PACE, FIA_UAU.5/PACE and FIA_UAU.6/EAC.
Physical part of the travel document	Travel document in form of paper, plastic and chip using secure printing to present data including (but not limited to) 1. biographical data, 2. data of the machine-readable zone, 3. photographic image and 4. other data.
Pre-Personalisation	Process of writing Pre-Personalisation Data (see below) to the TOE including the creation of the travel document Application (cf. sec. 1.2, TOE life-cycle, Phase 2, Step 5)
Pre-personalisation Data	Any data that is injected into the non-volatile memory of the TOE by the travel document Manufacturer (Phase 2) for traceability of non-personalised travel document's and/or to secure shipment within or between life cycle phases 2 and 3. It contains (but is not limited to) the Personalisation Agent Key Pair.
Pre-personalised travel document's chip	travel document's chip equipped with a unique identifier.
Receiving State	The Country to which the traveller is applying for entry. [6]
Reference data	Data enrolled for a known identity and used by the verifier to check the verification data provided by an entity to prove this identity in an authentication attempt.
RF-terminal	A device being able to establish communication with an RF-chip according to ISO/IEC 14443 [15].
Secondary image	A repeat image of the holder's portrait reproduced elsewhere in the document by whatever means. [6]

Term	Definition
Secure messaging in encrypted/combined mode	Secure messaging using encryption and message authentication code according to ISO/IEC 7816-4 [14]
Service Provider	An official organisation (inspection authority) providing inspection service which can be used by the travel document holder. Service Provider uses terminals (BIS-PACE) managed by a DV.
Skimming	Imitation of the inspection system to read the logical travel document or parts of it via the contactless communication channel of the TOE without knowledge of the printed MRZ data.
Standard Inspection Procedure	A specific order of authentication steps between an travel document and a terminal as required by [4], namely (i) PACE or BAC and (ii) Passive Authentication with SO_D. SIP can generally be used by BIS-PACE and BIS-BAC.
Terminal	A terminal is any technical system communicating with the TOE either through the contact based or contactless interface. A technical system verifying correspondence between the password stored in the travel document and the related value presented to the terminal by the travel document presenter. In this PP the role 'Terminal' corresponds to any terminal being authenticated by the TOE. Terminal may implement the terminal's part of the PACE protocol and thus authenticate itself to the travel document using a shared password (CAN or MRZ).
Terminal Authorization	Intersection of the Certificate Holder Authorizations defined by the Inspection System Certificate, the Document Verifier Certificate and Country Verifying Certification Authority which shall be all valid for the Current Date.
Terminal Authorisation Level	Intersection of the Certificate Holder Authorisations defined by the Terminal Certificate, the Document Verifier Certificate and Country Verifying Certification Authority which shall be all valid for the Current Date.
TOE tracing data	Technical information about the current and previous locations of the travel document gathered by inconspicuous (for the travel document holder) recognising the travel document.
Travel document	Official document issued by a state or organisation which is used by the holder for international travel (e.g. passport, visa, official document of identity) and which contains mandatory visual (eye readable) data and a separate mandatory data summary, intended for global use, reflecting essential data elements capable of being machine read; see [6] (there "Machine readable travel document").
Travel Document	The rightful holder of the travel document for whom the issuing State or

Term	Definition
Holder	Organisation personalised the travel document.
Travel document's Chip	A contact based/contactless integrated circuit chip complying with ISO/IEC 14443 [15] and programmed according to the Logical Data Structure as specified by ICAO, [6], sec III.
Travel document's Chip Embedded Software	Software embedded in a travel document's chip and not being developed by the IC Designer. The travel document's chip Embedded Software is designed in Phase 1 and embedded into the travel document's chip in Phase 2 of the TOE life-cycle.
Traveller	Person presenting the travel document to the inspection system and claiming the identity of the travel document holder.
TSF data	Data created by and for the TOE that might affect the operation of the TOE (CC part 1 [1]).
Unpersonalised travel document	The travel document that contains the travel document chip holding only Initialization Data and Pre-personalisation Data as delivered to the Personalisation Agent from the Manufacturer.
User data	All data (being not authentication data) (i) stored in the context of the ePassport application of the travel document as defined in [5] and (ii) being allowed to be read out solely by an authenticated terminal acting as Basic Inspection System with PACE . CC give the following generic definitions for user data: Data created by and for the user that does not affect the operation of the TSF (CC part 1 [1]). Information stored in TOE resources that can be operated upon by users in accordance with the SFRs and upon which the TSF places no special meaning (CC part 2 [2]).
Verification	The process of comparing a submitted biometric sample against the biometric reference template of a single enrollee whose identity is being claimed, to determine whether it matches the enrollee's template. [6]
Verification data	Data provided by an entity in an authentication attempt to prove their identity to the verifier. The verifier checks whether the verification data match the reference data known for the claimed identity.

Table 8: Glossary

Acronyms

Acronym	Term
BIS	Basic Inspection System
BIS-PACE	Basic Inspection System with PACE
CA	Chip Authentication
CAN	Card Access Number
CC	Common Criteria
EAC	Extended Access Control
EF	Elementary File
ICCSN	Integrated Circuit Card Serial Number.
MF	Master File
MRZ	Machine readable zone
n.a.	Not applicable
OSP	Organisational security policy
PACE	Password Authenticated Connection Establishment
PCD	Proximity Coupling Device
PICC	Proximity Integrated Circuit Chip
PP	Protection Profile
PT	Personalisation Terminal
RF	Radio Frequency
SAR	Security assurance requirements
SFR	Security functional requirement
SIP	Standard Inspection Procedure
TA	Terminal Authentication
TOE	Target of Evaluation
TSF	TOE Security Functions
TSP	TOE Security Policy (defined by the current document)

Table 9: Acronyms

8 Literature

[1]: Common Criteria for Information Technology Security Evaluation, Part 1: Introduction and General Model; CCMB-2009-07-001, Version 3.1, Revision 3, July 2009

[2]: Common Criteria for Information Technology Security Evaluation, Part 2: Security Functional Components; CCMB-2009-07-002, Version 3.1, Revision 3, July 2009

[3]: Common Criteria for Information Technology Security Evaluation, Part 3: Security Assurance Components; CCMB-2009-07-003, Version 3.1, Revision 3, July 2009

[4]: ICAO MACHINE READABLE TRAVEL DOCUMENTS, TECHNICAL REPORT, Supplemental Access Control for Machine Readable Travel Documents, Version 1.00, November 2010

[5]: Technical Guideline TR-03110, Advanced Security Mechanisms for Machine Readable Travel Documents –Extended Access Control (EAC), Password Authenticated Connection Establishment (PACE), and Restricted Identification (RI), October 2010

[6]: International Civil Aviation Organization, ICAO Doc 9303, Machine Readable Travel Documents – Machine Readable Passports, 2006 (this includes the latest supplemental for ICAO Doc 9303 which also should be considered)

[7]: Common Criteria Protection Profile Machine Readable Travel Document using Standard Inspection Procedure with PACE (PACE PP), BSI-CC-PP-0068-V2-2011, Version 1.0, November 2011

[8]: Common Criteria Protection Profile Machine Readable Travel Document with „ICAO Application", Basic Access Control, BSI-PP-0055, Version 1.10, 25th March 2009

[9]: Security IC Platform Protection Profile; registered and certified by BSI (Bundesamt für Sicherheit in der Informationstechnik) under the reference BSI-PP-0035-2007, Version 1.0, June 2007

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[13]: Bundesamt für Sicherheit in der Informationstechnik (BSI), Technical Guideline TR-03111 Elliptic Curve Cryptography, TR-03111, 17.04.2009

[14]: ISO/IEC 7816: Identification cards — Integrated circuit cards, Version Second Edition, 2008

[15]: ISO/IEC 14443 Identification cards -- Contactless integrated circuit cards -- Proximity cards, 2008-11