

FIPS 201 Evaluation Program - PIV Card Approval Procedure

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1 Introduction

1.1 Overview

The FIPS 201 Evaluation Program (EP) is a U.S. Government entity administered by the Office of Government-wide Policy (OGP), within the General Services Administration (GSA) agency. The goal of the FIPS 201 Evaluation Program (EP) is to evaluate products and services against the requirements outlined in FIPS 201 and its supporting documents. In addition to derived test requirements developed to test conformance to the National Institute of Standards and Technology (NIST) Standard, GSA has also established interoperability and performance metrics to further determine product suitability. A set of approval and test procedures have been developed which outline the evaluation criteria, approval mechanisms and test process employed by the Laboratory during their evaluation of a Supplier's product or service against the requirements for that category.

A Supplier desiring to submit a PIV Card (hereafter referred to as the Product) for evaluation must follow the Suppliers Policies and Procedures Handbook. In addition to this handbook, Supplier also need to refer to this Approval Procedure which provides the necessary category-specific details in order to have a Supplier's Product evaluated by the EP and placed on the Approved Products List (APL).

1.2 Category Description

The *PIV Card* is a smartcard with both contact and contactless interfaces that meets the interface, data format, graphical, and physical requirements of FIPS 201 and SP 800-73.

1.3 Purpose

The purpose of this document is to provide the following information:

- (i) Provide a list of the artifacts and/or documentation that needs to be submitted to the Evaluation Lab as part of the application package submission.
- (ii) Document the list of the requirements that apply to this category
- (iii) Specify the evaluation criteria along with their approval mechanisms that will be used by Evaluation Labs to verify compliance of the Product against the requirements that apply to this category.

2 Application Package Contents

The Application Package Contents include the artifacts, documentation and in some cases the product itself that needs to be submitted to the Evaluation Lab so that evaluation can be performed. The Application Package Contents for this category include the following:

- The Product itself. This should be delivered to the lab (address can be found at <http://fips201ep.cio.gov/labs.php>) using a secure delivery method that requires acknowledgement of receipt (e.g., FedEx, UPS, hand delivery).
- Completed Application Form, provided on the Evaluation Program website. (This form will be available through the web interface once users have been assigned a login credential.);
- Completed and signed Lab Service Agreement (found in the application submission package ZIP file). The Lab Service Agreement should be completed and scanned into a document to be uploaded to Evaluation Program website;
- Completed and signed Attestation Form (found in the application submission package ZIP file). The Attestation Form should be completed and scanned into a document to be uploaded to Evaluation Program website;
- Completed Supplier VDR-VTDR justification worksheet (found in the application submission package ZIP file);
- A Vendor Test Data Report, which provides test results showing that the Product/Service complies with the requirements for this category. In this regard, the Supplier is expected to develop and document the test procedures used to determine how the Product was tested to arrive at the conclusion that it met all necessary requirements.
- Official Certification documentation from the appropriate entity (e.g., NIST) showing conformance of the Product to the tested requirements of FIPS 201. Specific reference to the exact type of certification necessary can be found in the Certification section found in Section 3.3 of this document.
- All necessary Supplier documentation providing proof that the Product complies with the subset of requirements (as outlined in Section 3.1) for this category which has Supplier documentation review as its approval mechanism. Examples of specific documentation would include: user guides, technical specifications, white papers, line cards, etc.

Additionally, the Supplier needs to provide the following information to the Lab:

- PIN to the card which has the CHUID and Biometric Fingerprint loaded.
- PIN Unlock Key (PUK) value for submitted card.
- Digital Certificates for each certificate container on the PIV applet. The corresponding private key must be generated on-card and be able to be referenced for each certificate container. (e.g. The private key which corresponds to the PIV Authentication Certificate is referenced using the key identifier '9A')

3 Evaluation Procedure for PIV Card

3.1 Requirements

In order to approve the Product as conformant to the requirements of PIV, it at a minimum, must comply with all the requirements listed below. The approval mechanism column describes the technique utilized by the Lab to evaluate compliance to that particular requirement.

Identifier #	Requirement Description	Source	Reqt. #	Approval Mechanism
PIV-C.1	The PIV Card shall comply with characteristics as described in ISO/IEC 7810.	FIPS 201-1, Section 4.1	1.1-35	Vendor Documentation Review
PIV-C.2	The PIV Card shall comply with characteristics as described in ISO/IEC 10373.	FIPS 201-1, Section 4.1	1.1-35	Vendor Documentation Review
PIV-C.3	The PIV Card shall comply with characteristics as described in ISO/IEC 7816 for contact cards.	FIPS 201-1, Section 4.1	1.1-35	Vendor Documentation Review
PIV-C.4	The PIV Card shall comply with characteristics as described in ISO/IEC 14443 for contactless cards.	FIPS 201-1, Section 4.1	1.1-35	Vendor Documentation Review
PIV-C.5	The PIV Card shall contain a contact and a contactless ICC interface.	FIPS 201-1, Section 4.1.3	1.1-44	Vendor Documentation Review
PIV-C.6	The card body structure shall consist of card material(s) that satisfy the card characteristics in ISO 7810.	FIPS 201-1, Section 4.1.3	1.1-45	Vendor Documentation Review
PIV-C.7	The card body structure shall consist of card material(s) that satisfy the test methods in American National Standards Institute (ANSI) 322.	FIPS 201-1, Section 4.1.3	1.1-45	Vendor Documentation Review
PIV-C.8	The ANSI 322 test methods tests shall be used to evaluate card material durability and performance.	FIPS 201-1, Section 4.1.3	1.1-45	Vendor Documentation Review
PIV-C.9	The ANSI 322 tests shall include card flexure.	FIPS 201-1, Section 4.1.3	1.1-45	Vendor Test Data Report
PIV-C.10	The ANSI 322 tests shall include	FIPS 201-1,	1.1-45	Vendor Test

	card static stress.	Section 4.1.3		Data Report
PIV-C.11	The ANSI322 tests shall include plasticizer exposure.	FIPS 201-1, Section 4.1.3	1.1-45	Vendor Test Data Report
PIV-C.12	The ANSI 322 tests shall include impact resistance.	FIPS 201-1, Section 4.1.3	1.1-45	Vendor Test Data Report
PIV-C.13	The ANSI 322 tests shall include card structural integrity.	FIPS 201-1, Section 4.1.3	1.1-45	Vendor Test Data Report
PIV-C.14	The ANSI 322 tests shall include Delamination – 90°.	Derived	N/A	Vendor Test Data Report
PIV-C.15	If the PIV Card contains a magnetic stripe, the ANSI 322 tests shall include Magnetic Stripe Abrasion.	Derived	N/A	Vendor Documentation Review Vendor Test Data Report
PIV-C.16	Cards shall not malfunction after hand cleaning with a mild soap and water mixture.	FIPS 201-1, Section 4.1.3	1.1-45	Vendor Test Data Report Lab Test Data Report
PIV-C.17	The reagents called out in Section 5.4.1.1 of ISO 10373 shall be modified to include a two percent soap solution.	FIPS 201-1, Section 4.1.3	1.1-45	Vendor Test Data Report Lab Test Data Report
PIV-C.18	The card shall be subjected to actual, concentrated, or artificial sunlight to appropriately reflect 2000 hours of southwestern United States' sunlight exposure. The tests shall be in accordance with ANSI 322, Section 5.15.	FIPS 201-1, Section 4.1.3	1.1-46	Vendor Test Data Report
PIV-C.19	The card shall be subjected to the ISO 10373 dynamic bending test and shall have no visible cracks or failures.	FIPS 201-1, Section 4.1.3	1.1-46	Vendor Test Data Report
PIV-C.20	The card shall be 27- to 33-mil thick (before lamination) in accordance with ISO 7810.	FIPS 201-1, Section 4.1.3	1.1-47	Vendor Documentation Review
PIV-C.21	The card material shall allow production of a flat card in accordance with ISO 7810 after lamination of one or both sides of	FIPS 201-1, Section 4.1.3	1.1-43	Vendor Test Data Report Lab Test Data

	the card.			Report
PIV-C.22	The PIV Card must be activated to perform privileged operations such as reading biometric information and using asymmetric keys.	FIPS 201-1, Section 4.1.6	1.1-85	Certification
PIV-C.23	The PIV Card shall be activated for privileged operations only after authenticating the cardholder or the appropriate card management system.	FIPS 201-1, Section 4.1.6	1.1-86	Certification
PIV-C.24	PIV Cards shall implement PIN-based cardholder activation to allow privileged operations using PIV credentials held by the card.	FIPS 201-1, Section 4.1.6.1	1.1-87	Certification
PIV-C.25	For PIN-based cardholder activation, the cardholder shall supply a numeric PIN.	FIPS 201-1, Section 4.1.6.1	1.1-88	Certification
PIV-C.26	The PIN shall be transmitted to the PIV Card and checked by the card. If the presented PIN is correct, the PIV Card is activated.	FIPS 201-1, Section 4.1.6.1	1.1-89	Certification
PIV-C.27	The PIV Card shall include mechanisms to limit the number of guesses an adversary can attempt if a card is lost or stolen.	FIPS 201-1, Section 4.1.6.1	1.1-90	Certification
PIV-C.28	The PIN authentication mechanism shall meet the identity-based authentication requirements of FIPS PUB 140-2 Level 2. [FIPS140-2]	FIPS 201-1, Section 4.1.6.1	1.1-92	Certification
PIV-C.29	The PIV CHUID shall be accessible from the contact interface of the PIV Card without card activation.	FIPS 201-1, Section 4.2	1.1-96	Certification
PIV-C.30	The PIV CHUID shall be accessible from the contactless interface of the PIV Card without card activation.	FIPS 201-1, Section 4.2	1.1-97	Certification
PIV-C.31	Cryptographic operations with this key [PIV Authentication] are performed only through the	FIPS 201-1, Section 4.3	1.1-105	Certification

	contact interface.			
PIV-C.32	The PIV Card shall implement RSA or elliptic curve key pair generation.	FIPS 201-1, Section 4.3	1.1-106	Certification
PIV-C.33	The PIV Card shall implement RSA or elliptic curve private key cryptographic operations.	FIPS 201-1, Section 4.3	1.1-106	Vendor Documentation Review Certification
PIV-C.34	The PIV Card shall implement importation and storage of X.509 certificates.	FIPS 201-1, Section 4.3	1.1-106	Vendor Documentation Review Certification
PIV-C.35	All cryptographic operations using the PIV keys shall be performed on-card.	FIPS 201-1, Section 4.3	1.1-111	Certification
PIV-C.36	All PIV cryptographic keys shall be generated within a FIPS 140-2 validated cryptomodule with overall validation at Level 2 or above.	FIPS 201-1, Section 4.3	1.1-116	Certification
PIV-C.37	The PIV Card shall provide [FIPS 140-2] Level 3 physical security to protect the PIV private keys in storage.	FIPS 201-1, Section 4.3	1.1-117	Certification
PIV-C.38	The PIV Authentication Key shall be generated on the PIV Card.	FIPS 201-1, Section 4.3	1.1-118	Certification
PIV-C.39	The PIV Card shall not permit exportation of the PIV authentication key.	FIPS 201-1, Section 4.3	1.1-118	Certification
PIV-C.40	The PIV authentication key shall only be available through the contact interface of the PIV Card.	FIPS 201-1, Section 4.3	1.1-118	Certification
PIV-C.41	The PIV Card shall not permit exportation of the card authentication key, if present.	FIPS 201-1, Section 4.3	1.1-120	Certification
PIV-C.42	The PIV digital signature key, if present, shall be generated on the PIV Card.	FIPS 201-1, Section 4.3	1.1-121	Certification
PIV-C.43	The PIV Card shall not permit exportation of the digital signature	FIPS 201-1,	1.1-	Certification

	key.	Section 4.3	121	
PIV-C.44	Cryptographic operations using the digital signature key, if present, shall only be performed using the contact interface of the PIV Card.	FIPS 201-1, Section 4.3	1.1-121	Certification
PIV-C.45	Private key operations using the digital signature key shall only be performed after explicit user action.	FIPS 201-1, Section 4.3	1.1-121	Certification
PIV-C.46	The Key Management Key shall be either generated on the PIV Card or imported to the card.	FIPS 201-1, Section 4.3	1.1-123	Certification
PIV-C.47	If present, the key management key must only be accessible using the contact interface of the PIV Card.	FIPS 201-1, Section 4.3	1.1-123	Certification
PIV-C.48	If the key management key is present, the PIV Card shall import and store a corresponding X.509 certificate to support validation of the key.	FIPS 201-1, Section 4.3	1.1-123	Certification
PIV-C.49	If present, the card management key shall be imported onto the card by the issuer.	FIPS 201-1, Section 4.3	1.1-124	Certification
PIV-C.50	If present, the card management key shall only be accessible using the contact interface of the PIV Card.	FIPS 201-1, Section 4.3	1.1-124	Vendor Documentation Review Certification
PIV-C.51	If supported, initialization and update of trust anchor certificates shall require explicit cardholder action, in addition to activation of the card.	FIPS 201-1, Section 4.3	1.1-126	Certification
PIV-C.52	Biometric data specified to be stored on the PIV Card under FIPS 201 shall NOT be accessed over the contactless interface.	FIPS 201-1, Section 4.4	1.1-130	Certification
PIV-C.53	PIV biometric data shall be protected through an authentication mechanism such as	FIPS 201-1, Section 4.4.2	1.1-144	Certification

	a PIN.			
PIV-C.54	At a minimum, PIV Cards shall support either the T=0 or T=1 transmission protocol as defined in ISO/IEC 7816-3:1997. The card may support both protocols.	Card /Card Reader Interoperability Requirements Section 2.1.1.3	3-3	Lab Test Data Report
PIV-C.55	PIV Cards shall not require the use of any RFU bits in the Global or Specific Interface Bytes to operate correctly.	Card /Card Reader Interoperability Requirements Section 2.1.1.4	3-4	Lab Test Data Report
PIV-C.56	Retrieval time of CHUID components through the contactless interface of the card shall not exceed 1.0 seconds.	Derived	N/A	Lab Test Data Report
PIV-C.57	Retrieval time of the fingerprint biometrics through the contact interface of the card shall not exceed 1.0 seconds.	Derived	N/A	Lab Test Data Report
PIV-C.58	PIV Cards shall not require a Programming Voltage to operate correctly.	Card /Card Reader Interoperability Requirements Section 2.1.1.1	3-1	Vendor Test Data Report
PIV-C.59	PIV cards shall support the Class A operating class as defined in ISO/IEC 7816-3:1997 and ISO/IEC 7816-3:1997/Amd 1:2002.	Card /Card Reader Interoperability Requirements Section 2.1.1.2	3-2	Vendor Test Data Report Lab Test Data Report
PIV-C.60	PIV Cards submitted for testing shall have the biometric fingerprint buffer populated, which has been retrieved from the EP Website.	Derived	N/A	Vendor Documentation Review Lab Test Data Report
PIV-C.61	PIV Cards submitted for testing shall have the CHUID available, on the contactless ICC, which has been retrieved from the EP Website.	Derived	N/A	Vendor Documentation Review Lab Test Data Report
PIV-C.62	Zone 3—Magnetic Stripe. If used, the magnetic stripe shall be high	FIPS 201-1, Section 4.1.4.4	1.1-72	Vendor Documentation

	coercively.			Review
PIV-C.63	Zone 3—Magnetic Stripe. If used, the magnetic stripe shall be placed in accordance with ISO-7811, as illustrated in Figure 4-7.	FIPS 201-1, Section 4.1.4.4	1.1-72	Vendor Documentation Review
PIV-C.64	To activate the card for personalization or update, the card shall perform a challenge response with a card management system using cryptographic keys stored on the card in accordance with [SP800-73].	Derived	N/A	Vendor Test Data Report Vendor Documentation Review
PIV-C.65	Card management keys shall meet the algorithm and key size requirements stated in Special Publication 800-78-1, Cryptographic Algorithms and Key Sizes for Personal Identity Verification. [SP800-78]	FIPS 201-1, Section 4.1.6.2	1.1-95	Vendor Documentation Review
PIV-C.66	The PIV Card shall store a corresponding X.509 certificate to support validation of the PIV Authentication private key.	Derived	N/A	Vendor Test Data Report
PIV-C.67	The PIV Card shall store a corresponding X.509 certificate to support validation of the Digital Signature private key.	Derived	N/A	Vendor Test Data Report
PIV-C.68	The PIV Card shall store a corresponding X.509 certificate to support validation of the Key Management private key.	Derived	N/A	Vendor Test Data Report
PIV-C.69	The PIV Card shall store a corresponding X.509 certificate to support validation of the Card Authentication private key, if applicable.	Derived	N/A	Vendor Test Data Report

Table 1 - Applicable Requirements

3.2 Approval Mechanism Matrix

The table below provides an indication of the total number of requirements applicable for the Product and provides a breakup of how the evaluation will be conducted based on the different approval mechanisms available to the Lab.

Total Requirements	Approval Mechanisms					
	SV	VTDR	LTDR	VDR	C	A
72	N/A	22	10	17	32	1
Legend: SV – Site Visit; VTDR – Vendor Test Data Report; LTDR – Lab Test Data Report; VDR – Vendor Doc. Review; C – Certification; A – Attestation						

Table 2 - Approval Mechanism Matrix

3.3 Evaluation Criteria

This section provides details on the process employed by the Lab for evaluating the Product against the requirements enumerated above.

3.3.1 Vendor Test Data Report

The Lab will update the status in the Web-Enabled Tool to “VTDR Begun” as instructed in the Web-enabled Tool Laboratory User Guide.

3.3.1.1 PIV-C.9

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Card Flexure</i>: The Product has been tested using the test procedure defined in Section 5.4.3 of ANSI 322. <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> a. A report generated as a result of flexure testing showing that at least ten (10) cards have been subjected to a minimum of 10,000 cycles of card flexure on both axes (5 cards per axis). b. After subjecting to at least 10,000 cycles of flexure, test to verify that that the cards respond to a card reader by passing back its ATR string to the host system.
Expected Result:	<ol style="list-style-type: none"> 1. A minimum of four (4) out of the five (5) cards per axis (or 80% in case of a sampling size greater than 5) tested have been subjected to 10,000 cycles.

	<p>of card flexure, and:</p> <ol style="list-style-type: none"> Have not developed a single fracture¹ of at least 13 mm long or a combination of 5 fractures or fewer that total at least 13mm, and Respond to an ATR command
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3.3.1.2 PIV-C.10

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> <i>Static Stress:</i> The Product has been tested using the test procedure defined in Section 5.5.3 of ANSI 322. <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> A report generated as a result of static stress testing, showing that a minimum of 10 cards have been tested (5 cards per axis). The report must show that cards were subjected to the static stress test for a period of 24 hours, after which time the cards are removed from the stress fixture and inserted into the card impact fixture (see Figure 15 for exact measurements and weight requirements of the fixture).
Expected Result:	A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested per axis do not have a single fracture that has progressed to at least 13 mm in length.

3.3.1.3 PIV-C.11

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> <i>Plasticizer Testing:</i> The Product has been tested using the test procedure defined in Section 5.6.3 of ANSI 322. <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> A report generated as a result of plasticizer testing which shows that at least 5 cards have been tested. The cards shall be subjected to the plasticizer and static stress test for a period of one-hundred (100) hours.
Expected Result:	A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested do not have a single fracture that has progressed to at least 13 mm in length.

¹ A fracture is defined as a crack or break in the card which the depth appears to be at least 1/3 of the card thickness (taken from ANSI 322)

3.3.1.4 PIV-C.12

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Impact Resistance</i>: The Product has been tested using the test procedure defined in Section 5.7.3 of ANSI 322. <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> A report generated as a result of impact testing which shows that a minimum of 10 non-laminated cards with ICCs have been tested † (5 cards with the ICC facing up, and 5 cards with the ICC facing down). The test should be conducted using an 18 Newton impact weight which has been dropped from a height of 0.635 meters (25 inches). The cylindrical dart centerline should be positioned at 30 mm from the short side of the card, which does not contain the ICC. <p>† Note: If magnetic stripes are able to be applied to the card by the Supplier, this test shall be performed using cards with magnetic stripes.</p>
Expected Result:	A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested per side have not fractured.

3.3.1.5 PIV-C.13

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Structural Integrity</i>: The Product has been tested using the test procedure defined in Section 6.1.3 of ANSI 322. <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> A report generated as a result of structural integrity testing which shows that a minimum of 5 cards have been tested using the Stage 2B tests. The report must state the material or material composites used to construct the card body. At the end of testing, record the number of cards that respond to a card reader by passing back its ATR string to the host system.
Expected Result:	<p>A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested:</p> <ol style="list-style-type: none"> Do not show signs of complete separation of card layers Respond to an ATR command

3.3.1.6 PIV-C.14

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Delamination - 90°</i>: The Product has been tested using the test
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	<p>procedure defined in Section 5.2.3 of ANSI 322.</p> <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> A report generated as a result of 90° delamination testing which shows that a minimum of 5 cards have been tested. The report must also show that the cards tested have resisted a minimum peel strength of 2 lbf/in².
Expected Result:	A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested have resisted the minimum peel strength value.

3.3.1.7 PIV-C.15

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> <i>Magnetic Stripe Abrasion:</i> The Product has been tested using the test procedure defined in Section 5.11.3 of ANSI 322 as well as the apparatus defined in Section 5.11.2. <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> A report generated as a result of testing, showing that a minimum of 5 cards have been tested for at least 200 cycles. The report must state the material used to construct the magnetic stripe as well as the initial signal amplitude and ending signal amplitude. At the end of testing, the average signal amplitude, U_A, is not less than 70% of the initial signal amplitude, $U_{A \text{ Initial}}$, in the read area, shown in Figure 19.
Expected Result:	A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested passed the magnetic stripe abrasion test, having a difference in signal amplitude not less than 70%.

3.3.1.8 PIV-C.16

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> <i>Hand Cleaning:</i> The Product has been tested to verify that the personalized card does not delaminate after cleaning with a mild soap solution (e.g. Dawn, Joy, Palmolive, etc.) <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the Lab:</p> <ol style="list-style-type: none"> A report generated as a result of hand cleaning which shows the
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² Although specific threshold values are not provided in ANSI 322 for this test, the requirement of resistance to 2 lbf/in has been taken from Section 8.8 of ISO 7810:2003.

	length of time for which the card (a minimum of 5 cards) was washed, the type of soap used, and whether or not the card has delaminated or shows signs of delamination.
Expected Result:	A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested have not delaminated or show signs of delamination.

3.3.1.9 PIV-C.17

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Resistance to Chemicals</i>: The Product has been tested using the test procedure defined in Section 5.4.2 of ISO 10373. <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> a. A report generated as a result of chemical testing which shows that both short term and long term contamination tests have been performed as called out in ISO 10373. The short term contamination test shall include a test using a two percent soap and water solution has been completed. Each test must be performed on a minimum of 5 cards. b. After testing, verify whether each card was able to respond to contact and contactless smart card readers by responding with their ATR upon card connection.
Expected Result:	<p>A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested:</p> <ol style="list-style-type: none"> a. Remain visually in good condition, meaning cards are not bent, twisted, puckered, bubbles have not started to form on the surface, or portions of the card dissolved, and b. Respond to an ATR command.

3.3.1.10 PIV-C.18, PIV-C.19

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Sunlight Exposure</i>: The Product has been tested using the test procedure defined in ANSI 322, Section 5.15. • <i>Dynamic Bending Stress</i>: The Product has been subjected to a dynamic bending stress test described in ISO 10373, Section 5.8 using the apparatus depicted in Figure 10. <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> a. A report generated as a result of sunlight exposure, showing that a minimum of 10 cards were tested – 5 cards tested using the front and
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	<p>the other 5 tested using the back,</p> <p>b. Using the cards tested in the sunlight exposure test, subject each card to the ISO 10373 dynamic bending stress test. With the card facing up, perform 250 bends. Repeat this process on the perpendicular axis. Flip the card over and repeat both tests again. A total of 1,000 bends per card shall be performed.</p>
Expected Result:	<p>1. A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested have not fractured or any overlays are not peeling, bubbling, or cracking.</p>

3.3.1.11 PIV-C.21

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Flat Card Production:</i> The Product has been tested to simulate the effects of lamination of the card, using the test procedure found in ISO 7810, Annex A. <p>As a result of testing, the following must be included as part of the Vendor Test Data forwarded to the lab:</p> <ol style="list-style-type: none"> a. A report showing that a minimum of 10 cards were subjected to the heat resistance test described in ISO 7810. 5 cards are tested with the front side up and the remaining 5 with the back side up. b. The Δh values for each of the cards tested.
Expected Result:	<p>A minimum of 4 out of 5 cards (or 80% in case of a sampling size greater than 5) tested have a Δh value less than 3 mm.</p>

3.3.1.12 PIV-C.58

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Programming Voltage:</i> PIV Cards do not require a programming voltage to operate correctly. <p>At a minimum, the following test scenario must be performed to confirm compliance:</p> <ol style="list-style-type: none"> a. Populate the CHUID container with valid data on a reference smart card. b. Create a test harness that will allow monitoring of the Vpp pin of the reader/smart card c. Begin monitoring of the Vpp pin voltage level d. Present the reference smart card to the Reader and perform a GET_DATA on each of the containers e. End monitoring of Vpp pin.
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Expected Result:	Results of the Vpp log shall show that no voltage is applied during operation of the GET_DATA command.
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3.3.1.13 PIV-C.59

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Class A Operating Class Support:</i> The Product has been tested to verify that it supports Class A operating class. <p>At a minimum, the following test scenario must be performed to confirm compliance:</p> <ol style="list-style-type: none"> Populate the CHUID data container on the PIV Card being submitted for evaluation. Using a Class A only reader, insert the PIV Card into the reader and perform a GET_DATA on the CHUID data container. Report the results of the test showing the make, model, and firmware (if applicable) of the Class A only reader used for testing.
Expected Result:	Results of the test conclude that the PIV Card supports the Class A operating class.

3.3.1.14 PIV-C.60, PIV-C.61, PIV-C.64, PIV-C.66 – PIV-C.69

Evaluation Procedure:	<p>The Lab will review the documentation submitted by the Supplier to ascertain the following:</p> <ul style="list-style-type: none"> • <i>Card Update:</i> The product contains a mechanism to perform a cryptographic challenge-response with a card management system using cryptographic keys stored on the card. The keys are in accordance with SP 800-78. <p>At a minimum, the following test scenario must be performed to confirm compliance: (ALL STEPS MUST BE THOROUGHLY DOCUMENTED)</p> <ol style="list-style-type: none"> Insert a card into a smartcard reader. Using the APDUs presented in SP 800-73, Appendix B, or another vendor specific method, perform a cryptographic challenge response with the card. Populate the certificate data container(s) on the PIV Card being submitted for evaluation.
Expected Result:	Results of the test conclude that the PIV Card supports a cryptographic challenge-response for activation or update.

3.3.2 Vendor Documentation Review

Reference(s):	PIV-C.1 to PIV-C.8, PIV-C.20, PIV-C.33, PIV-C.34, PIV-C.50, PIV-C.60 to PIV-C.65
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Evaluation Procedure:	<ol style="list-style-type: none"> 1. The Lab will update the status in the Web-Enabled Tool to “VDR Begun” as instructed in the Web-enabled Tool Laboratory User Guide. 2. The Lab will review the documentation submitted by the Supplier to ascertain the following: <ul style="list-style-type: none"> ▪ <i>ISO 7810 Compliance (PIV-C.1, PIV-C.20)</i> <ul style="list-style-type: none"> • The card’s physical characteristics comply with ISO 7810. • The card is between 27 - 33 mil. thick before lamination ▪ <i>ISO 10373 Compliance (PIV-C.2)</i> <ul style="list-style-type: none"> • The card’s physical characteristics comply with ISO 10373. ▪ <i>ISO 7816 Compliance (PIV-C.3)</i> <ul style="list-style-type: none"> • The card’s physical characteristics comply with ISO 7816 for contact cards. ▪ <i>ISO 14443 Compliance (PIV-C.4)</i> <ul style="list-style-type: none"> • The card’s physical characteristics comply with ISO 14443 for contactless cards. ▪ <i>ICC Interfaces (PIV-C.5)</i> <ul style="list-style-type: none"> • The card contains both a contact and a contactless ICC interface. ▪ <i>Card Construction Materials (PIV-C.6, PIV-C.7)</i> <ul style="list-style-type: none"> • The card body structure consists of construction materials which satisfy the card characteristics in ISO 7810. • The card body materials have been disclosed. • The card body structure consists of construction materials which satisfy the test methods in ANSI 322. ▪ <i>ANSI 322 Testing (PIV-C.8)</i> <ul style="list-style-type: none"> • The card durability and performance tests conform to the ANSI 322 test methods. ▪ <i>Magnetic Stripe (PIV-C.15)</i> <ul style="list-style-type: none"> • The magnetic stripe materials have been disclosed. • The magnetic stripe is of high coercivity. ▪ <i>Cryptographic Operations (PIV-C.38)</i> <ul style="list-style-type: none"> • The cryptographic operations the card supports, as well as key sizes, have been disclosed. ▪ <i>Certificate Importation (PIV-C.34)</i> <ul style="list-style-type: none"> • The X.509 certificates which the card can import have been disclosed. ▪ <i>Card Management Key Support (PIV-C.64)</i> <ul style="list-style-type: none"> • State whether or not the card supports the card management key (9B key), as defined in SP 800-73-1.
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	<ul style="list-style-type: none"> • If the card does not support the card management key, state what mechanism the card supports for an application administrator to update data objects on the card. <ul style="list-style-type: none"> ▪ <i>PIV Card Data Contents (PIV-C.60, PIV-C.61)</i> <ul style="list-style-type: none"> • The CHUID, which has been posted to the EP Website, has been loaded onto the contact ICC of the PIV Card. <ul style="list-style-type: none"> a. For dual chip implementations, the CHUID has been loaded onto the contactless ICC of the PIV Card. • The biometric data, which has been posted to the EP Website, has been loaded onto the contact ICC of the PIV Card. ▪ <i>Zone 3 (PIV-C.62, PIV-C.63)</i> Optional Zones <ul style="list-style-type: none"> • The magnetic is of high coercivity and shall be placed in accordance with ISO-7811. ▪ <i>Card Management Keys (PIV-C.65)</i> <ul style="list-style-type: none"> • The algorithms specified are consistent with the requirements of SP 800-78-1. <p>3. The Lab will update the status to “VDR Complete” as instructed in the Web-enabled Tool Laboratory User Guide.</p>
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3.3.3 Certification

Reference(s):	PIV-C.22 to PIV-C.53
Evaluation Procedure:	<ol style="list-style-type: none"> 1. The Lab will update the status in the Web-Enabled Tool to “C Begun” as instructed in the Web-enabled Tool Laboratory User Guide. 2. The Lab will perform the following activities for the PIV Card in order to determine certification status of the Product with SP 800-85 specifications: <ul style="list-style-type: none"> ▪ Examine the certification statement to see if it provided by the NPIVP Labs/NIST and that it is still current (i.e. valid); ▪ Verify the authenticity of this certification provided by the NPIVP Labs/NIST; ▪ Review the list of certified PIV Cards to determine inclusion of the Product on the validated list of Products available on the website located at: http://csrc.nist.gov/npivp/. 3. The Lab will perform the following activities for the PIV Card in order to determine certification status of the Product with FIPS 140-2 Level 2 requirements: <ul style="list-style-type: none"> ▪ Examine the certification statement to see if it provided by the NIST/CSE and that it is still current i.e. valid; ▪ Verify the authenticity of this certification provided by the NIST/CSE; and

	<ul style="list-style-type: none"> ▪ Review the FIPS 140-2 Cryptographic Modules Validation List to determine inclusion of the Product and the level at which it has been certified. The list is available on the website located at: http://csrc.nist.gov/cryptval/140-1/1401val.htm. <p>4. The Lab will update the status to “C Complete” as instructed in the Web-enabled Tool Laboratory User Guide.</p>
Expected Results:	<p>1. The PIV Card has received the following certifications</p> <ul style="list-style-type: none"> a. Certification from an accredited NIST Personal Identity Verification Program (NPIVP) Lab determining the Product to have been tested as conformant to the PIV Card Application as defined in SP 800-73-1. b. Certification from NIST/CSE stating compliance with FIPS 140-2 Overall validation Level 2, Roles, Services and Authentication Level 2, Physical Security Level 3.

3.3.4 Lab Test Data Report

Reference(s):	PIV-C.19, PIV-C.20, PIV-C.24, PIV-C.57 to PIV-C.60, PIV-C.62 to PIV-C.66
Test Procedure:	<p>1. The Lab will update the status in the Web-Enabled Tool to “LTDR Begun” as instructed in the Web-enabled Tool Laboratory User Guide.</p> <p>2. The Lab will execute test procedures for this category in accordance with the “<i>PIV Card Test Procedure</i>.”</p> <p>3. The Lab will update the status to “LTDR Complete” as instructed in the Web-enabled Tool Laboratory User Guide.</p>

3.3.5 Attestation

Reference(s):	N/A
Evaluation Procedure:	<p>1. The Lab will update the status in the Web-Enabled Tool to “A Begun” as instructed in the Web-enabled Tool Laboratory User Guide.</p> <p>2. Review the Attestation Form provided by the Supplier, confirming that the Product to the best of their knowledge, conforms to all the necessary requirements of the category under which the Product applies. Verify that person signing this Attestation Form has the authority to do so (a minimum “C” level [e.g. CSO, CEO, CIO, CFO, Vice-President, President, Business Partner or Owner]).</p> <p>3. The Lab will update the status in the Web-Enabled Tool to “A Complete” as instructed in the Web-enabled Tool Laboratory User Guide.</p>
Expected Results:	<p>1. The Attestation Form has been signed by an authorized individual (e.g. CSO, CEO, CIO, CFO, Vice-President, President, Business Partner or Owner).</p>