Required IV&V Testing
Of the Common Access Card

B. Physical Characteristics

- Standards compliance: ISO 7816, ISO 7810, ISO 10373-1 and ISO14443-1 (for cards with contactless interfaces). Any manufacturing process required to meet the requirements in this specification will meet the ISO standards and result in a flat card.
- Card material: Card body shall be polyvinyl chloride (PVC) in the laminate construction as described below:
  - Minimum requirement of card material is that it consist of a PVC core, with polyethylene terephthalate (PET) layers that comprise at least 40% of the overall card thickness placed between the outer PVC layers and the inner PVC core.
- Alternate cardstock material that is equivalent or superior to PVC with a 40% PET content as described above, may be considered, if the contractor's proposal provides sufficient evidence and proof that it will perform equally or better for ink adhesion, lack of curling after lamination, and card longevity.
- Preference shall be given to cards with longer life capabilities as determined by testing in accordance with (IAW) ANSI NCITS 322, Card Durability Test Methods.
- For cards without contactless interfaces, card body to accept Dye Diffusion Thermal Transfer (D2T2) and resin thermal transfer imaging on front and back of card body. For cards with contactless interfaces, card body to accept reverse transfer print imaging on front and back of card body.
- 27 to 31 mil card thickness (prior to lamination) in accordance with the ISO standard.
- In addition to the ISO and other tests specified in the Cardstock Specification, cards will be subjected to the ANSI INCITS 322, Card Durability Test Methods. While the INCITS 322 test methods do not currently specify compliance requirements, the tests will be used to compare the performance of cards from different manufacturers. Thus, preference will be given to cards that demonstrate greater durability based on these test results. Examples of the INCITS 322 tests include card flexure, static stress, plasticizer exposure, impact resistance, card structural integrity, surface abrasion, magnetic stripe abrasion, temperature and humidity induced dye migration, ultraviolet light exposure, and a laundry test. These tests will be performed on cards with and without contactless interfaces.
- Resistance to Chemicals: The card shall be resistant to chemical effects arising from use in a flight line environment. The reagents called out in section 5.4.1.1 of ISO/IEC 10373-1 shall be modified to include gasoline (87 Octane), Jet A, Hydraulic fluid (MIL-H5606 or equivalent), and mineral spirits (ASTM D235 or equivalent). Immersion time shall be 1 minute.
- Cleaning: Cards shall not malfunction or delaminate after hand cleaning with a mild soap and water. The reagents called out in section 5.4.1.1 of ISO/IEC 10373-1 shall be modified to include a 2% soap solution. A card shall be deemed acceptable if it meets these cleaning requirements.

- Ultraviolet light: The card shall be subjected to actual, concentrated or artificial sunlight to appropriately reflect 2000 hours of Southwestern United States sunlight exposure IAW ISO/IEC 10373-1, Section 5.12. Concentrated sunlight exposure will be performed IAW ASTM G90-98, and accelerated exposure IAW ASTM G155-00. Alternatively, the card may be subjected to the ANSI INCITS 322 tests for UV and daylight fading resistance. After exposure, the card shall be subjected to the ISO 10373-1 dynamic bending test and shall have no visible cracks or failures. The card shall not malfunction after the dynamic bending evaluation.
- Lamination: The cardstock shall withstand the effects of high temperatures required by the application of a 1 mil polyester laminate on one or both sides of the card by COTS equipment. The cardstock provided shall allow production of a flat card IAW ISO 7810 after lamination of one or both sides of the card. The Government will specify single sided, dual-sided, or no lamination at time of order.
- The Government understands that application of heat during the printing and lamination processes may result in very small amounts of card shrinkage. The dimensions of blank cards provided to the Government shall be ISO compliant prior to personalization. Following personalization (printing and lamination), the card height shall remain no less than 85.27 mm and the card width shall remain no less than 53.75 mm while continuing to meet the other appropriate ISO requirements. Personalized cards shall continue to remain interoperable with COTS and Government provided card readers and equipment.
- Peel Strength: Due to the tamper-resistant features of some embedded Optically Variable Devices (OVDs), the Government accepts that the minimum peel strength requirement in ISO 7810 may not be met for the OVD patch in the layer of the cardstock that contains it. The minimum peel strength requirement will be addressed on a case-by-case basis. However, the remainder of the cardstock layer with the OVD and the remainder of the card body shall meet all requirements of ISO 7810.

- Quality Assurance/Compliance Testing. All blank cardstock accepted by the Government is required to comply with the following ISO specifications and requirements prior to printing and lamination. The tests outlined below should be performed and the findings submitted to the Government as a bound report.

For cards without a contactless interface, the following tests shall be performed:

ISO7810: Identification Cards—Physical Characteristics

Test	Minimum Sample Size
Dimensions of Cards (Card width, height, thickness, corners)	
Bending Stiffness	
Flammability	
Resistance to Chemicals	
Card Dimensional Stability with temperature and humidity	

Delamination	
Adhesion or Blocking	
Light Transmittance	
Card Warpage	

ISO7811-6: Identification Cards—Magnetic Stripe—High Coercivity

Test	Minimum Sample Size
Surface Profile	
Surface Roughness	
Location of Magnetic Stripe	
Wear from Read/Write Head	
Resistance to Chemicals	
"Table 1" Tests (Unencoded card test)	

ISO7816-1: Identification Cards—Integrated Circuit(s) Cards with Contacts—Physical Characteristics:

Test	Minimum Sample Size
UV light	
X-rays	
Surface Profile of Contacts	
Mechanical Strength	
Electrical Resistance	
Electromagnetic Interference	
Static Electricity	
Bending Properties	
Torsion Properties	

For cards with one or more a contactless interfaces, the following tests shall be performed:

ISO7810: Identification Cards—Physical Characteristics

Test	Minimum Sample Size
Dimensions of Cards (Card width, height, thickness, corners)	
Bending Stiffness	
Flammability	
Resistance to Chemicals	
Card Dimensional Stability with temperature and humidity	
Delamination	
Adhesion or Blocking	
Light Transmittance	
Card Warpage	

ISO7811-6: Identification Cards—Magnetic Stripe—High Coercivity

Test	Minimum Sample Size
Surface Profile	
Surface Roughness	
Location of Magnetic Stripe	
Wear from Read/Write Head	
Resistance to Chemicals	
"Table 1" Tests (Unencoded card test)	

ISO7816-1: Identification Cards—Integrated Circuit(s) Cards with Contacts—Physical Characteristics:

Test	Minimum Sample Size
X-rays	
Surface Profile of Contacts	
Mechanical Strength	
Electrical Resistance	
Electromagnetic Interference	
Static Electricity	
Bending Properties	
Torsion Properties	

ISO1443-1: Identification Cards—Integrated Circuit(s) Cards with Contacts—Physical Characteristics:

Test	Minimum Sample Size
X-rays	
Static Magnetic Field	
Static Electricity	
Dynamic Bending Stress	
Dynamic Torsion Stress	

Note that the x-ray exposure, static electricity, dynamic bending stress, and dynamic torsion stress tests only need to be run once for hybrid cards, despite being listed in both the ISO7816-1 and ISO14443 standards.

- Test Reports and Certification: Vendors should supply test results for these tests indicating that the cards meet or exceed the ISO requirements. The vendor shall ensure that the supplied and tested cards are representative of the overall manufacturing lot; should changes be made to shipped cards or card design, testing must be redone and resubmitted for acceptance.