

## 1. Source of the Proposed Standard

### 1.1 Title

Stress and Evaluation Methods for Card Durability Characterization

### 1.2 Date Submitted

3/2/2007

### 1.3 Proposer

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## 2. Process Description for the Proposed Project

### 2.1 Project Type (Development or Revision)

This proposal is a "D" Development project to be conducted within the INCITS Technical Committee B10.3. The expected result is an ANSI standard.

### 2.2 Type of Document

The proposed document will be developed as a standard.

### 2.3 Definitions of Concepts and Special Terms

- 2.3.1 **Stress method:** A procedure for applying a prescribed set of environmental conditions (e.g., mechanical, chemical or thermal) for a prescribed duration (e.g., time or cycles) to a card for the purpose of emulating the consumption of some portion of the useable life of the card in an accelerated manner, relative to normal use conditions
- 2.3.2 **Evaluation method:** A destructive or nondestructive procedure for quantifying a specified characteristic of a card
- 2.3.3 **Card Durability Characterization:** The process of applying one or more stress methods, followed by the application of one or more evaluation methods to quantify card characteristics that are relevant to typical acceptance or use criteria. Examples of card characteristics include, but are not limited to:
  - warpage resistance,
  - abrasion resistance,
  - dimensional stability,
  - environmental stability,
  - card structural integrity.
- 2.3.4 **Condition:** A selectable set of parametric values which is used to define the magnitude, direction, duration or extent of a stress applied to a card
- 2.3.5 **Condition Table:** A table of bounded, but selectable parameter values associated with a stress method. Each set of parameter values comprises a "condition" which may be selected as the most appropriate stress to apply to a card, based on the technology comprising the card, the applications in which the card will be used, or the construction of the card. A table includes a range of conditions which represent low, intermediate and high stress values corresponding to low, intermediate and high acceleration of failure mechanisms that are expected within normal use conditions.

## **2.4 Expected Relationship with Approved Reference Models, Frameworks, Architectures, etc.**

This standard is expected to provide the foundation and tools for future card durability characterization and service life specifications.

Currently there are 13 standards related to card physical characteristics and card durability. The list of standards includes but is not limited to;

- ISO 7816-1 Integrated Circuit(s) Card with Contacts – Part 1: Physical Characteristics
- ISO 10373-1 Identification Cards – Test Methods – Part 1: General Characteristics Tests
- ISO 10373-2 Identification Cards – Test Methods – Part 2: Cards with Magnetic Stripes
- ISO 10373-3 Identification Cards – Test Methods – Part 3: Integrated Circuit(s) Cards with Contacts and Related Interface Devices
- ISO 10373-5 Identification Cards – Test Methods – Part 5: Optical Memory Cards
- ISO 10373-7 Identification Cards – Test Methods – Part 7: Vicinity Cards
- ISO 7810 for Identification Cards – Physical Characteristics
- ISO 14443-1 Identification Cards – Contactless Integrated Circuit(s) Cards – Proximity Cards – Part 1: Physical Characteristics
- ISO 15693-1 Identification cards – Contactless integrated circuit(s) cards – Vicinity cards – Part 1: Physical characteristics
- ISO 10536-1 Identification cards – Contactless integrated circuit(s) cards – Close-coupled cards – Part 1: Physical characteristics
- ISO 10536-2 Identification cards – Contactless integrated circuit(s) cards – Part 2: Dimensions and location of coupling areas
- ANSI/INCITS 322 for Information Technology – Card Durability Test Methods
- ANSI/INCITS B10.3 Card Service Life (pending Document No. INCITS B10.3 06-033, under development)

The current, related standards specify physical card characteristics and qualitative procedures for card comparisons. These standards do not address, nor do they provide a means for, quantitative card durability characterization.

## **2.5 Recommended INCITS Development Technical Committee (Existing or New)**

The proposed standard will be developed within the ANSI/INCITS B10.3 Task Group, ID Card Durability and Service Life Standards. This group is experienced in developing test methodologies related to the physical durability of identification cards.

## **2.6 Anticipated Frequency and Duration of Meetings**

The work schedule for the proposed standard would be incorporated into the current ANSI/INCITS B10.3 Task Group and Card Durability Task Force meetings. Currently these meetings occur 3 times annually for a duration of 1-2 days. Additional meetings will be held as required by the committee.

## **2.7 Target Date for Initial Public Review (Milestone 4)**

The target date for public review is set as August of 2007.

## **2.8 Estimated Useful Life of Standard or Technical Report**

As proposed, the standard establishes a foundation for quantitative card durability characterization. It is anticipated that the proposed standard is useful as long as cards are used as a means of identification.

# **3. Business Case for Developing the Proposed Standard or Technical Report**

## **3.1 Description**

Identification cards are currently used in a number of different commercial applications, including access control, banking, personal identification, and ticketing. The prolonged functional integrity of such cards is often termed as “card durability” or “card service life”. There can be significant costs associated with the replacement of cards which prematurely fail. Therefore, there is a need to determine the potential and

relative durability of identification cards as part of the procurement decision process. However, not all commercial applications have the same requirements for card durability. Historically, cards have been manufactured to fulfill a range of durability requirements. Cards used in different market segments also may incorporate a range of technologies that include; printed characters and images, contactless chips, contact chips, dual interface chips, and magnetic stripes.

This new standard defines stress and evaluation methods for performing card durability characterization with the end result of quantifying card characteristics. The methods in the standard include descriptions of applicable test equipment, procedural details and evaluation reports that comprise a systematic method of card durability characterization.

The first section of the proposed standard defines how the card is stressed to emulate relevant use conditions. The test equipment and procedures of this section are described in sufficient detail to enable the repeatable and reproducible application of stresses.

The second section of the proposed standard defines test equipment, procedures, and reporting requirements in sufficient detail to enable the repeatable and reproducible evaluation of card characteristics. These characteristics include, but are not limited to, quantities such as surface uniformity, impact resistance, micromodule adhesion, and laminae peel strength. Functional evaluations for machine readable elements are referenced to their relevant, existing standards. The evaluation methods presented in this section of the standard can be applied to both stressed and non-stressed cards. The acceptance or rejection criteria of cards, based on results from these stress and evaluation methods, are not within the scope of this standard.

### **3.2. Existing Practice and the Need for a Standard**

Currently, most identification card standards are concerned with only the physical characteristics of a card and do not address card durability characterization. The current standards that do attempt to address card durability have inherent limitations. First, the test methods in these standards are fixed combinations of stress and evaluation methods. This approach is not suitable for characterizing the wide range of multi-technology and dual-interface cards that are used in many current and emerging commercial and government applications. Second, some of the test methods in the current standards have subjective elements and yield results that are qualitative, by design. Some methods also lack sufficiently rigorous equipment or procedural descriptions to ensure that all laboratories, operators, customers, and card manufacturers are able to conduct card characterization in a repeatable and reproducible manner.

A quantitative, card durability characterization standard is needed to ensure that; 1) cards can be stressed and evaluated in a repeatable and reproducible manner and, 2) provisions exist to accommodate the specification of the most appropriate combinations of stresses, conditions and evaluations according to card construction, technology or application.

### **3.3. Implementation Impacts of the Proposed Standard**

#### **3.3.1 Development Costs**

There will be no foreseen cost to INCITS for this activity. Development costs will be part of the normal committee participation expenses.

#### **3.3.2 Impact on Existing or Potential Markets**

Standardization of stress and evaluation methods ensures that current and future cards are characterized in a repeatable and reproducible manner. The proposed standard constitutes a “toolbox” of quantitative stress and evaluation methods that enables emerging markets to tailor specifications and characterization procedures based on card construction, application, or technology.

Currently, no durability characterization standard exists, and no existing standards are designed to allow a card to be uniquely characterized based on card construction, application or technology. As a result, performance of irrelevant or inappropriate tests creates an increased burden on testing laboratories, card

manufacturers, and end users in both, time and money. It also confounds the processes of designing, producing and selecting cards to achieve the most cost effective solution for an application.

### **3.3.3 Costs and Methods for Conformity Assessment**

The foreseen costs associated with adopting this standard are related to attestation and calibration of test equipment.

### **3.3.4 Return on Investment**

For laboratories, card manufacturers, or customers already engaged in card testing, there is no additional investment required to adopt this standard. Efficiencies, in both time and money, will be gained by applying only the stress and evaluation methods which are deemed to be relevant to a given product.

## **3.4 Legal Considerations**

### **3.4.1 Patent Assertions**

At the time of the proposed standard, the proposers do not know of any patent infringement claims.

### **3.4.2 Dissemination of the Standard or Technical Report**

The proposers will provide the INCITS Secretariat with a PDF file of the proposed standard for dissemination to the appropriate INCITS committees, INCITS Executive Board, and for public review. The proposers retain editorial rights until the proposed standard is approved as an American National Standard, at which time the standard will be transferred in accordance with INCITS policies.

## **4. Related Standards Activities**

### **4.1 Existing Standards**

ANSI/INCITS B10.3 Technical Reports and pending Standards documents relating to card service life.

### **4.2 Related Standards Activity**

ANSI/INCITS 322 for Information Technology – Card Durability Test Methods

ANSI/INCITS B10.3 Technical Reports and pending Standards documents relating to card service life.

### **4.3 Recommendations for Close Liaison**

ANSI/INCITS B10.6 Physical Characteristics, Mag Stripe, Embossing, Test Methods, Coexistent Technologies

ISO/IEC JTC1/SC17/WG1/TF2 – Physical characteristics and test methods for ID-cards

## **5. Units of Measurement used in the Standard**

SI (MKS) with dual reporting in US customary units (FPS).