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**Identification cards — Test methods —**

**Part 1:**  
General characteristics tests

*Cartes d'identification — Méthodes d'essai —*

*Partie 1: Essais des caractéristiques générales*

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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 10373-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Identification cards and related devices*.

ISO/IEC 10373 consists of the following parts, under the general title *Identification cards — Test methods*:

- *Part 1: General characteristics tests*
- *Part 2: Cards with magnetic stripes*
- *Part 3: Integrated circuit(s) cards*
- *Part 5: Optical memory cards*

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# Identification cards — Test methods —

## Part 1: General characteristics tests

### 1 Scope

ISO/IEC 10373 defines test methods for characteristics of identification cards according to the definition given in ISO/IEC 7810. Each test method is cross-referenced to one or more base standards, which may be ISO/IEC 7810 or one or more of the supplementary standards that define the information storage technologies employed in identification cards applications.

NOTE 1 - Criteria for acceptability do not form part of ISO/IEC 10373 but will be found in the International Standards mentioned above.

NOTE 2 - Test methods described in ISO/IEC 10373 are intended to be performed separately. A given card is not required to pass through all the tests sequentially.

This part of ISO/IEC 10373 defines test methods which are common to one or more card technologies. Other parts of ISO/IEC 10373 define technology-specific test methods.

### 2 Normative references

[ISO/IEC 10373-1:1998](https://standards.iteh.ai/catalog/standards/sist/85a197d5-c5a3-4863-ac62-079b536d8988/iso-iec-10373-1-1998)

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The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 10373. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 10373 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5-2:1991, *Photography - Density measurements - Part 2: Geometric conditions for transmission density.*

ISO 105-E04:1994, *Textiles - Tests for colour fastness - Part E04: Colour fastness to perspiration.*

ISO 1817:1985, *Rubber, vulcanized - Determination of the effect of liquids.*

ISO 1302:1992, *Technical drawings - Method of indicating surface texture.*

ISO/IEC 7810:1995, *Identification cards - Physical characteristics.*

ISO/IEC 7811-1:1995, *Identification cards - Recording technique - Part 1: Embossing.*

ISO/IEC 7811-2:1995, *Identification cards - Recording technique - Part 2: Magnetic stripe.*

ISO/IEC 7811-6:1996, *Identification cards - Recording technique - Part 6: Magnetic stripe - High coercivity.*

ISO/IEC 7813:1995, *Identification cards - Financial transaction cards.*

ISO/IEC 7816-1:1998, *Identification cards - Integrated circuit(s) cards with contacts - Part 1: Physical characteristics.*

ISO 9227:1990, *Corrosion tests in artificial atmospheres - Salt spray tests.*

ISO/IEC 10536-1:1992, *Identification cards - Contactless integrated circuit(s) cards - Part 1: Physical characteristics.*

ISO/IEC 11694-3:1995, *Identification cards - Optical memory cards - Linear recording method - Part 3: Optical properties and characteristics.*

### 3 Terms and definitions

For the purposes of this part of ISO/IEC 10373, the following terms and definitions apply.

#### 3.1

##### **test method**

method for testing characteristics of identification cards for the purpose of confirming their compliance with International Standards

#### 3.2

##### **testably functional**

has survived the action of some potentially destructive influence to the extent that:

- a) any magnetic stripe present on the card shows a relationship between signal amplitudes before and after exposure that is in accordance with the base standard
- b) any integrated circuit(s) present in the card continues to show an Answer to Reset response<sup>1</sup> which conforms to the base standard
- c) any contacts associated with any integrated circuit(s) present in the card continue to show electrical resistance and impedance which conform to the base standard
- d) any optical memory present in the card continue to show optical characteristics which conform to the base standard

#### 3.3

##### **warpage**

deviation from flatness

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#### 3.4

##### **embossing relief height (of a character)**

local increase in the height of the card surface produced by the embossing process

#### 3.5

##### **peel strength**

ability of a card to resist separation of adjacent layers of material in its structure

#### 3.6

##### **resistance to chemicals**

ability of a card to resist degradation of its performance and appearance as a result of exposure to commonly encountered chemicals

#### 3.7

##### **dimensional stability**

ability of a card to resist dimensional variation when exposed to defined temperatures and humidity

#### 3.8

##### **adhesion or blocking**

tendency of new cards to stick together when stacked

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<sup>1</sup> This part of ISO/IEC 10373 does not define any test to establish the complete functioning of integrated circuit(s) cards. The test methods require only that the minimum functionality (testably functional) be verified. This may, in appropriate circumstances, be supplemented by further, application specific functionality criteria which are not available in the general case.



**3.9****bending stiffness**

ability of a card to resist bending

**3.10****dynamic bending stress**

cyclically applied bending stress of specified magnitude and orientation relative to the card

**3.11****dynamic torsional stress**

cyclically applied torsional stress of defined magnitude and orientation relative to the card

**3.12****flammability**

ability of a card, once ignited, to maintain and propagate a flame

**3.13****<optical> transmittance factor** **$T$** 

ratio of the measured <optical> flux transmitted by a specimen to the measured flux when the specimen is removed from the sampling aperture of the measuring device:

$$T = \Phi_t / \Phi_j$$

where

$T$  is the transmittance factor

$\Phi_t$  is the transmitted <optical> flux

$\Phi_j$  is the aperture flux

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[ISO 5-2:1991]

**3.14****opacity****<optical> transmission density** **$D_T$** 

logarithm to the base 10 of the reciprocal of the transmittance factor:

$$D_T = \log_{10} 1/T = \log_{10} \Phi_j / \Phi_t$$

[ISO 5-2:1991]

**3.15****normal use**

use as an Identification Card (see clause 4 of ISO/IEC 7810:1995), involving equipment processes appropriate to the card technology and storage as a personal document between equipment processes

**4 Default items applicable to the test methods****4.1 Test environment**

Unless otherwise specified, testing shall take place in an environment having a temperature  $23^\circ\text{C} \pm 3^\circ\text{C}$  ( $73^\circ\text{F} \pm 5^\circ\text{F}$ ) and relative humidity of 40% to 60%.

## 4.2 Pre-conditioning

Where pre-conditioning is required by the test method, the identification cards to be tested shall be conditioned to the test environment for a period of 24 h before testing.

## 4.3 Selection of test methods

Unless otherwise specified, tests shall be applied according to the attributes of the card to be tested, as shown in table 1.

**Table 1 — Selection of tests according to features present**

Test method	All cards	Card is embossed	Card has Mag stripe	Card has IC <sup>a</sup>	Card has CIC <sup>b</sup>	Card has OMA <sup>c</sup>
5.1 Card Warpage – overall	✓	✓	✓	✓	✓	✓
5.2 Dimensions of cards	✓	✓	✓	✓	✓	✓
5.3 Peel strength	✓	✓	✓	✓	✓	✓
5.4 Resistance to chemicals	✓	✓	✓	✓	✓	✓
5.5 Card stability and warpage with temperature and humidity	✓	✓	✓	✓	✓	✓
5.6 Adhesion or blocking	✓	✓	✓	✓	✓	✓
5.7 Bending stiffness	✓	✓	✓	✓	✓	✓
5.8 Dynamic bending stress (bending properties)	✓	✓	✓	✓	✓	✓
5.9 Dynamic torsional stress (torsion)				✓	✓	✓
5.10 Flammability (see NOTE)						
5.11 Opacity	✓	✓	✓	✓	✓	✓
5.12 Ultraviolet light				✓	✓	✓
5.13 X-rays				✓	✓	✓
5.14 Electromagnetic fields				✓	✓	✓
5.15 Embossing relief height of characters		✓				
NOTE - The flammability test is performed only when the application specifically requires it.						
<sup>a</sup> IC = integrated circuit <sup>b</sup> CIC = contactless integrated circuit <sup>c</sup> OMA = Optical memory area (of an optical memory card)						

## 4.4 Default tolerance

Unless otherwise specified, a default tolerance of  $\pm 5\%$  shall be applied to the quantity values given to specify the characteristics of the test equipment (e.g. linear dimensions) and the test method procedures (e.g. test equipment adjustments).

## 4.5 Total measurement uncertainty

The total measurement uncertainty for each quantity determined by these test methods shall be stated in the test report.

## 5 Test methods

### 5.1 Card warpage

The purpose of this test is to measure the degree of warpage of a card test sample (see ISO/IEC 7810:1995).

#### 5.1.1 Apparatus

A profile projector or similar measuring device with a minimum accuracy of 0,01 mm (0.0004 in).

#### 5.1.2 Procedure

Pre-condition the sample card according to 4.2 before testing and conduct the test under the test environment defined in 4.1.

Place the sample card on the level rigid plate of the measuring apparatus. At least three corners of the card shall rest on the plate (warpage of the card in convex form to the plate). Read the extent of warpage on the measuring device at the greatest point of displacement, measured from the front surface of the card (see figure 1).

NOTE – The point of maximum displacement is not necessarily at the centre of the card.

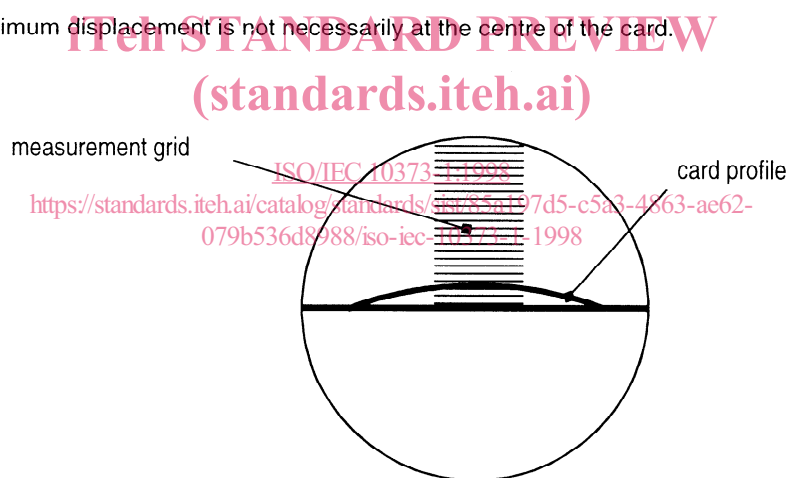


Figure 1 — Projector apparatus view of warpage measurement

#### 5.1.3 Test report

The test report shall give the value of warpage measured at the greatest point of displacement.

### 5.2 Dimensions of cards

The purpose of this test is to measure the height, width and thickness of a card test sample (see ISO/IEC 7810 :1995).

#### 5.2.1 Thickness of card measurements

##### 5.2.1.1 Apparatus

A micrometer with a flat anvil and spindle whose diameter is within the range of 3 mm to 8 mm (0.12 in to 0.32 in).