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**Identification cards — Test methods —  
Part 1:  
General characteristics**

*Cartes d'identification — Méthodes d'essai —  
Partie 1: 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 10373-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification*.

This second edition cancels and replaces the first edition (ISO/IEC 10373-1:1998), which has been technically revised. It also includes the Technical Corrigendum ISO/IEC 10373-1:1998/Cor.1:2002.

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

- *Part 1: General characteristics*
- *Part 2: Cards with magnetic stripes*
- *Part 3: Integrated circuit(s) cards with contacts and related interface devices*
- *Part 5: Optical memory cards*
- *Part 6: Proximity cards*
- *Part 7: Vicinity cards*

# Identification cards — Test methods —

## Part 1: General characteristics

### 1 Scope

ISO 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.

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.

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

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

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### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 1302:2002, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

ISO 1817, *Rubber, vulcanized — Determination of the effect of liquids*

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

ISO/IEC 10373-2, *Identification cards — Test methods — Part 2: Cards with magnetic stripes*

### 3 Terms and definitions

For the purposes of this document, 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 which conforms to the base standard;
  - d) any optical memory present in the card continues to show optical characteristics which conform to the base standard.

**3.3**  
**warpage**  
deviation from flatness

**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

**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

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1) 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.

**3.12****(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:

NOTE Not applicable to editions of ISO/IEC 7810 post-2003.

$$T = \Phi_t / \Phi_j$$

where

$T$  is the transmittance factor

$\Phi_t$  is the transmitted (optical) flux

$\Phi_j$  is the aperture flux

**3.13****opacity****(optical) transmission density** **$D_T$** 

logarithm to the base 10 of the reciprocal of the (optical) transmittance factor:

NOTE Not applicable to editions of ISO/IEC 7810 post-2003.

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

**3.14****normal use**

use as an identification card (see clause 4 of ISO/IEC 7810:2003), 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 of 23 °C ± 3 °C (73 °F ± 5 °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**

Tests shall be applied as required to test the attributes of the card defined by the relevant base standard.

**4.4 Default tolerance**

Unless otherwise specified, a default tolerance of ± 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.

##### 5.1.1 Apparatus

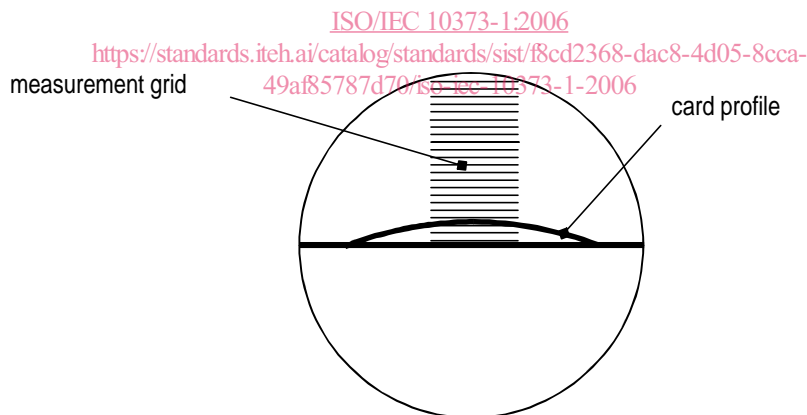
A profile projector or similar device with a minimum precision of 0,05 mm (0.0020 in).

##### 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.



Not to scale

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.



## 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), having a precision of 0,005 mm (0.00020 in).

### 5.2.1.2 Procedure

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

Use the micrometer to measure the thickness of the card at four points, one in each of the four quadrants of the card (see Figure 2 for the location of the quadrants). The measurements shall be made at locations on the card that do not include signature panels, magnetic stripes or contacts (integrated circuit/s cards), or any other raised area. The micrometer force shall be 3,5 N to 5,9 N (0.79 lbf to 1.33 lbf).

### 5.2.1.3 Test report

The test report shall give the maximum and the minimum values of the four measurements.

not to scale

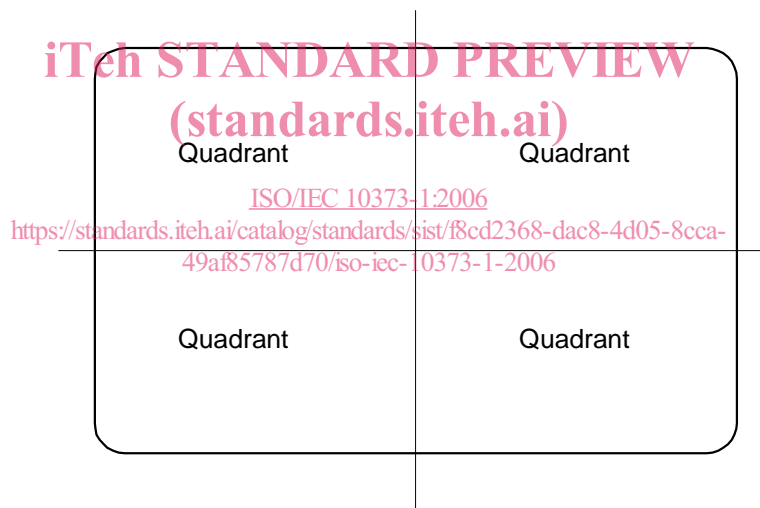


Figure 2 — Assignment of quadrants

## 5.2.2 Height and width of card measurement

### 5.2.2.1 Apparatus

The following items are required:

- a level horizontal rigid surface having an average roughness not greater than 3,2  $\mu\text{m}$  (0.000128 in) according to ISO 1302:2002;
- a measuring device with a precision of 2,5  $\mu\text{m}$  (0.0001 in);
- a load of 2,2 N  $\pm$  0,2 N (0.495 lbf  $\pm$  0.045 lbf).

**5.2.2.2 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 horizontal rigid surface and flatten it under the load. Measure the height and width of the card. Find the maximum and minimum height and the maximum and minimum width.

**5.2.2.3 Test report**

The test report shall state whether the card conforms to the base standard and shall record the maximum and minimum values of height and width recorded.

**5.3 Peel strength**

The purpose of this test is to measure the peel strength between card layers.

**5.3.1 Apparatus**

The following items are required:

- a) sharp cutting knife;
- b) pressure sensitive adhesive filament (fibre reinforced) tape or a suitable clamp;
- c) tensile tester equipped with chart recorder or equivalent;
- d) gripping device;
- e) (if required) stabilising plate backed with adhesive or adhesive tape and meeting the following requirements:
  - 1) the adhesive strength shall be sufficient to ensure that the plate and card do not separate during testing;
  - 2) the plate shall not bend during the measurement;
  - 3) the size of the plate shall be equal to, or greater than, the size of the card.

EXAMPLE A suitable plate might be a 60 mm × 90 mm × 2 mm aluminium plate backed with adhesive tape.

**5.3.2 Procedure**

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

Cut the card, or score through the layer, to produce sections of width 10,0 mm ± 0,2 mm (0.390 in ± 0.008 in) as shown in Figure 3.

not to scale  
dimensions in millimetres

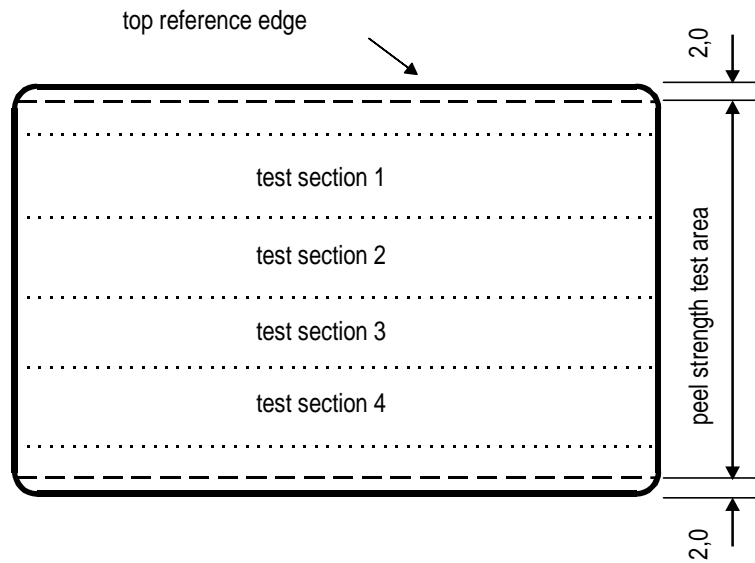


Figure 3 — Card preparation

Using a sharp knife, cut the layer back from the core approximately 10 mm (0.4 in) and apply the clamp or adhesive tape to the cut back edge of the layer and core as shown in Figure 4.

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not to scale  
dimensions in millimetres

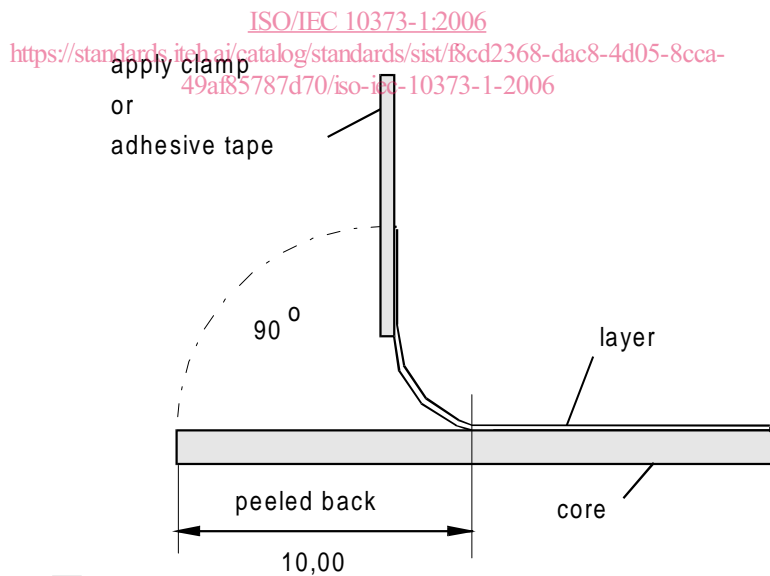


Figure 4 — Specimen preparation for peel test

If the peeling angle cannot be kept at 90° during the measurement, attach the stabilising plate to the core in advance.

Place the prepared specimen in the tensile tester fixture as shown in Figure 5. The card shall be fixed on the apparatus.