## INTERNATIONAL STANDARD



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## Identification cards — Test methods

Cartes d'identification — Méthodes d'essai **iTeh STANDARD PREVIEW** (standards.iteh.ai)

ISO/IEC 10373:1993 https://standards.iteh.ai/catalog/standards/sist/0a8d4510-d2ce-4e44-a7beed59f98b2816/iso-iec-10373-1993



## **Contents**

1 Scope	1
2 Normative references	1
3 Definitions	2
4 Default test environment and conditioning	2
5 Test methods	2
5.1 Card warpage	2
5.2 Dimensions of cards	4
5.3 Embossing relief height of character	5
5.4 Height and surface profile of the magnetic stripe	5
5.5 Surface roughness of the magnetic stripe	9
5.6 Wear test for magnetic stripe	9
5.7 Delamination iTeh STANDARD PREVIEW	10
5.8 Resistance to chemicals	12
5.9 Amplitude measurements (standards.iten.ai)	12
5.10 Card dimensional stability and warpage with temperature and humidity	15
5.11 Adhesion or blocking	15
5.12 Bending stiffness https://standards.iteh.ai/catalog/standards/sist/0a8d4510-d2ce-4e44-a7be-	16
5.13 Flammability	17
5.14 Light transmittance	17
5.15 Flux transition spacing variation	18
6 Test methods of the integrated circuit card	19
6.1 Dynamic bending stress (bending properties)	19
6.2 Dynamic torsional stress (torsion)	20
6.3 Location of contacts	21
6.4 Static electricity	22
6.5 Ultraviolet light	24
6.6 X-rays	24
6.7 Electrical resistance and impedance of contacts	25
6.8 Surface profile of contacts	25
6.9 Vibrations	27
6.10 Electromagnetic fields	29

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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 yote.

International Standard ISO/IEC 10373 was prepared by Joint Technical Committee ISO/IEC JTC 1, Information technology, Subcommittee SC 17, Identification cards and related devices. ISO/IEC 10373:1993

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#### **Identification cards - Test methods**

#### 1 Scope

This International Standard describes test methods for the characteristics of identification cards in accordance with ISO 7810, ISO 7811, ISO 7813, and ISO 7816.

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

NOTE 2 Test methods described in this International Standard 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

#### ISO/IEC 10373:1993

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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	5-1:1984,	Photography - Density measurements - Part 1: Terms, symbols and notations.
ISO	5-2:1991,	Photography - Density measurements - Part 2: Geometric conditions for transmission density.
ISO	5-3:1984,	Photography - Density measurements - Part 3: Spectral conditions.
ISO	105-E04:1989,	Textiles - Tests for colour fastness - Part E04: Colour fastness to perspiration.
ISO	1302:1992,	Technical drawings - Method of indicating surface texture.
ISO	1817:1985,	Rubber, vulcanized - Determination of the effect of liquids.
ISO	1880:1979,	Instruments for the measurement of surface roughness by the profile method - Contact (stylus) instruments of progressive profile transformation - Profile recording instruments.
ISO	9227:1990,	Corrosion tests in artificial atmospheres - Salt spray.
ISO	7810:1993,	Identification cards - Physical characteristics.
ISO	7811-1:1993,	Identification cards - Recording technique - Part 1: Embossing.
ISO	7811-2:1993,	Identification cards - Recording technique - Part 2: Magnetic stripe.
ISO	7811-3:1993,	Identification cards - Recording technique - Part 3: Location of embossed characters on ID-1 cards.

#### ISO/IEC 10373:1993(E)

- ISO 7811-4:1993, Identification cards Recording technique Part 4: Location of read-only magnetic tracks - Track 1 and 2.
- ISO 7811-5:1993, Identification cards Recording technique Part 5: Location of read-write magnetic track - Track 3.
- ISO 7813:1993, Identification cards Financial transaction cards.
- ISO 7816-1:1987, Identification cards Integrated circuit(s) cards with contacts Part 1: Physical characteristics.
- ISO 7816-2:1988, Identification cards Integrated circuit(s) cards with contacts Part 2: Dimensions and location of the contacts.
- IEC 512-2:1976, Electromechanical components for electronic equipment; basic testing procedures and measuring methods - Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests.

#### **3 Definitions**

For the purpose of this International Standard, the following definition applies.

**3.1 Test method**: Method for testing characteristics of identification cards for the purpose of confirming their compliance with International Standards.

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#### ISO/IEC 10373:1993

### 4 Default test environmenta and conditioning urds/sist/0a8d4510-d2ce-4c44-a7be-

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Unless otherwise specified, testing shall take place in an environment of temperature 23 °C  $\pm$  3 °C (73 °F  $\pm$  5 °F) and of relative humidity 40 % to 60 %. Identification cards shall be conditioned in this same environment for a period of 24 h before testing.

#### **5 Test methods**

#### 5.1 Card warpage

The purpose of this test is to measure the extent of warpage in the test sample (see ISO 7810). Card warpage is any deformation of card flatness.

#### 5.1.1 Overall card warpage of unembossed and embossed cards

5.1.1.1 Apparatus: A profile projector or measuring device with a minimum accuracy of 0,01 mm.

**5.1.1.2 Procedure:** Place the card to be tested on the level rigid plate of the measuring apparatus. The card edges shall rest on the plate (warpage of the card in convex form to the plate). Read the extent of warpage on the scale magnifier at the greatest point of displacement, measured from the front surface of the card.

5.1.1.3 Result: The extent of warpage at the greatest point of displacement (see figure 1).



Figure 1 - Projector apparatus view of warpage measurement

#### 5.1.2 Magnetic stripe area warpage for embossed and unembossed cards

#### 5.1.2.1 Apparatus:

a) A level rigid plate whose surface roughness is not greater than 3,2  $\mu$ m in accordance with ISO 1302. The plate shall contain an aperture to allow access for a micrometer probe, see figure 2;

b) a micrometer accurate to within 2,5  $\mu$ m with a probe whose contact area is a hemisphere with a diameter in the range of 3 mm to 8 mm. The force exerted by the probe shall be f = 0.6 N  $\pm 0.3$  N;

c) a means of applying a force F = 2,2 N (0.5 lbf) evenly distributed on the front face of the card opposite the magnetic stripe area (see figure 2).



Figure 2 - Measuring arrangement

NOTE 3 The load of 2,2 N should be increased by an amount f to compensate for the micrometer force which is acting in the opposite direction to that force.

**5.1.2.2 Procedure:** Place the sample card, front side up, on the level rigid plate. Position the magnetic stripe area to be measured over the aperture. Apply the force F(+f) directly over the magnetic stripe area on the front side of the card. Wait 1 minute before making any measurements. Measure the card stripe area for warpage at the nine positions along the stripe as shown in figure 3.

Not to scale Dimensions in millimetres



Figure 3 - Measuring points on the card



#### **5.2 Dimensions of cards**

The purpose of this test is to measure the height, width and thickness of an unembossed card test sample (see ISO 7810). (standards.iteh.ai)

#### 5.2.1 Thickness of card measurements

#### ISO/IEC 10373:1993

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. ed59f98b2816/iso-iec-10373-1993

**5.2.1.2 Procedure:** 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 4 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. Micrometer force shall be 3,5 N to 5,9 N.



Figure 4 - Assignment of quadrants

5.2.1.3 Result: The maximum and the minimum value of the four measurements shall be compared with the standardized value.

#### 5.2.2 Height and width of card measurement

5.2.2.1 Apparatus: A level horizontal rigid surface of a roughness not greater than 3,2  $\mu$ m according to ISO 1302. A profile projector with a precision of 2,5  $\mu$ m or adequate measuring device with the same accuracy. A load of 2,2 N  $\pm$  0,2 N.

5.2.2.2 Procedure: The card to be tested shall be placed on the level horizontal rigid surface and flattened under the 2,2 N  $\pm$  0,2 N load. Use the profile projector to measure the height and width of the card.

5.2.2.3 Result: The measurement/s obtained shall be compared with those given in ISO 7810.

#### 5.3 Embossing relief height of character

The purpose of this test is to obtain the overall and the relief height of imprinting character surfaces in the test sample. (see ISO 7811-1)

The embossing relief height of a character is the extent to which the card surface is raised by embossing action. **Teh STANDARD PREVIEW** 

5.3.1 Apparatus: See "5.2.1 Thickness of card measurements." 21)

**5.3.2 Procedure:** Use the micrometer with a force of 33,50 to 5,9 N to measure the embossed height of any one character. https://standards.iteh.ai/catalog/standards/sist/0a8d4510-d2ce-4e44-a7be-

ed59f98b2816/iso-iec-10373-1993

5.3.3 Result: Overall height is the direct measurement obtained from the test. Relief height is calculated by deducting the thickness of the card, as measured in the relevant quadrant (see figure 4) from the direct measurement obtained of the overall height.

#### 5.4 Height and surface profile of the magnetic stripe

The purpose of this test is to determine the degree of height and flatness of the magnetic stripe (see ISO 7811-2). The location of the stripe is described in ISO 7811-4 and ISO 7811-5. The height of the magnetic stripe is defined in relation to the card and the stripe surface profile.

**5.4.1 Apparatus:** Profilometer (example figure 5).

**5.4.2 Procedure:** The height and the surface profile of the magnetic stripe as well as the surrounding card surface shall be measured with a measuring recording instrument.



Figure 5 - Measuring device for the height and the profile of the magnetic stripe

The card to be tested is held under a notched rigid metal plate as described in figure 6. The plate applies a force of 2,2 N  $\pm$  0,1 N.



Figure 6 - Card holder plate (contact area)

NOTE 4 Any rigid metal can be used. Plate thickness depends on material to achieve 2,2 N  $\pm$  0,1 N. Tolerance on all dimensions of the plate :  $\pm$  0,5 mm.

The profile is measured at a maximum speed of 1 mm/s (0.04 in/s) with a probe having a radius of 0,38 mm to 2,54 mm (0.015 in to 0.1 in) applied with a force of 0,5 mN to 6 mN.

Three measurements are to be taken on each specimen across the width of the stripe. The three locations V, X and Y are defined as the distance of 15 mm  $\pm$  2 mm (0.59 in  $\pm$  0.08 in) from each end of the card and location X the centreline of the card (see figure 7).



Not to scale

Figure 7 - Magnetic stripe profile measurement location

The starting point for measurement along each line V,X,Y begins 1 mm min (0.039 in min) above the top edge of the magnetic media and ends 1 mm min (0.039 in min) below the bottom edge of the magnetic media.

When a measurement line crosses the integrated circuit contacts zone, an alternative line along the nearest parallel line, Z will be used which does not cross the integrated circuit contacts zone (for the measurement of the height of the magnetic stripe see "5.4.4 Height of the magnetic stripe").

Example profiles are shown in figures 8 and  $9_{\rm E}$  The maximum vertical deviation (a) is defined as the distance between the basic measurement line and the point on the magnetic media furthest away from, and at a right angle to the basic measurement line d5998b2816/iso-iec-10373-1993



Figure 8 - Concave stripe profile



a = maximum vertical deviationb = 1 mm (min)

w = minimum stripe width as

specified in ISO/IEC 7811-2



#### 5.4.3 Surface profile of the magnetic stripe

**5.4.3.1 Procedure:** For the measurements along V, X and Y line (see figure 7, a first basic measurement line (see figures 8 and 9) is formed by connecting the top and bottom points that define the magnetic media edges (whichever shows the greatest vertical dimension between the measuring line and the greatest peak or valley on the magnetic media). The maximum vertical deviation (a) is defined as the distance between the basic measuring line and the point on the magnetic media furthest away from, and at a right angle, to the basic measurement line.

5.4.3.2 Result: All three measurements shall comply with the profile criteria for card acceptance.

#### 5.4.4 Height of the magnetic stripe

**5.4.4.1 Procedure:** For the three measurements along V, X and Y (or Z line if Y line crosses integrated circuit contacts zone) as shown in figures 10 and 11, a basic measurement line is formed by connecting the starting and ending points (see figures 10 and 11). The maximal vertical deviation (h) is defined as the distance between the basic measurement line and the point on the magnetic media furthest away from, and at a right angle to, the basic measurement line.



Figure 11 - Convex stripe profile

5.4.4.2 Result: All the three measurements shall comply with the criteria for card acceptance.