

Identification cards — Test methods —

Part 1: General characteristics

ICS 35.240.15

National foreword

This British Standard is the UK implementation of ISO/IEC 10373-1:2006+A1:2012. It supersedes BS ISO/IEC 10373-1:2006, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO/IEC text carry the number of the ISO/IEC amendment. For example, text altered by ISO/IEC amendment 1 is indicated by **A1** **A1**.

The UK participation in its preparation was entrusted to Technical Committee IST/17, Cards and personal identification.

A list of organizations represented on this committee can be obtained on request to its secretary.

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INTERNATIONAL STANDARD

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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.

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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.

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*

ISO/IEC 7816-2, *Identification cards — Integrated circuit(s) cards with contacts — Part 2: Dimensions and location of the contacts*

IEC 60749-26, *Semiconductor devices — Mechanical and climatic test methods — Electrostatic discharge (ESD) sensitivity testing — Human body model (HBM)*

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 response¹⁾ 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

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.

$$T = \Phi_{\tau} / \Phi_j$$

where

T is the transmittance factor

Φ_{τ} is the transmitted (optical) flux

Φ_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.

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

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

A1 3.15

ICC

integrated circuit(s) card

3.16

typical protocol and application specific communication

any communication between a DUT and the corresponding test-apparatus based on protocol and application implemented in the DUT and representing its normal use

3.17

Test Scenario

defined typical protocol and application specific communication to be used with the test methods defined in this document

3.18

PICC

Proximity integrated circuit(s) card or object **A1**

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 $\pm 5\%$ 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.

4.6 Conventions for electrical measurements on ICCs with contacts

Potential differences are defined with respect to the GND contact of the ICC and currents flowing to the ICC are considered positive.

4.7 Apparatus for measurements on ICCs with contacts

4.7.1 Default ICC-holder, reference axes and default measurement position

When required by the test-method, the ICC shall be positioned in the default measurement position as subsequently defined.

The default measurement position requires the ICC to be positioned in an ICC-holder and flattened by a flattening plate. All Measurements using this default measurement position shall be relative to the reference axes defined in Figure Amd.1-1.

4.7.2 Default ICC-holder and reference axes:

The default ICC holder shall comply with Figure Amd.1-1:

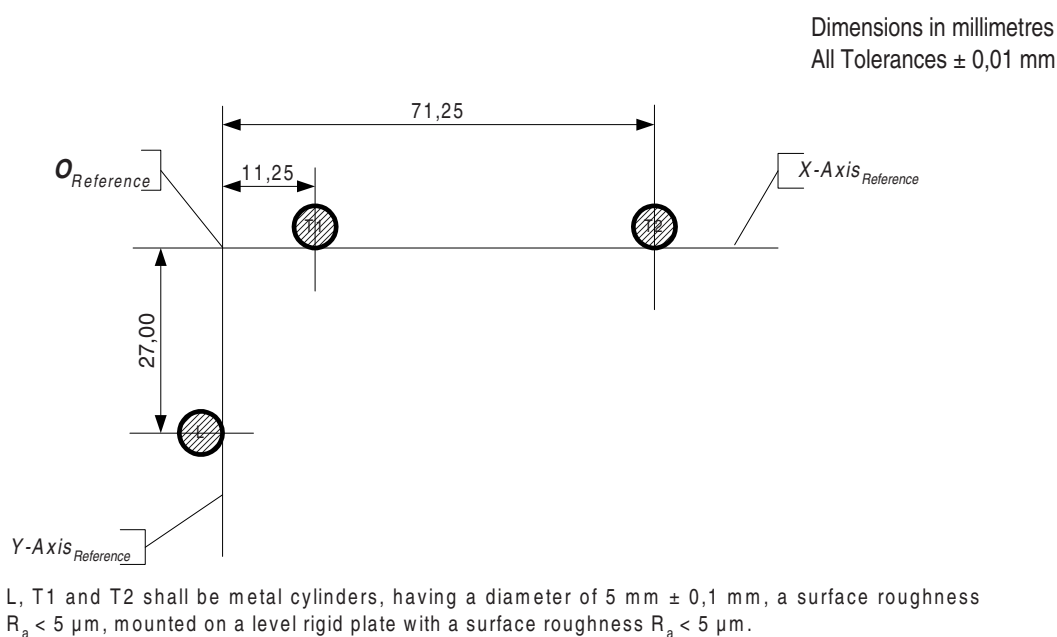
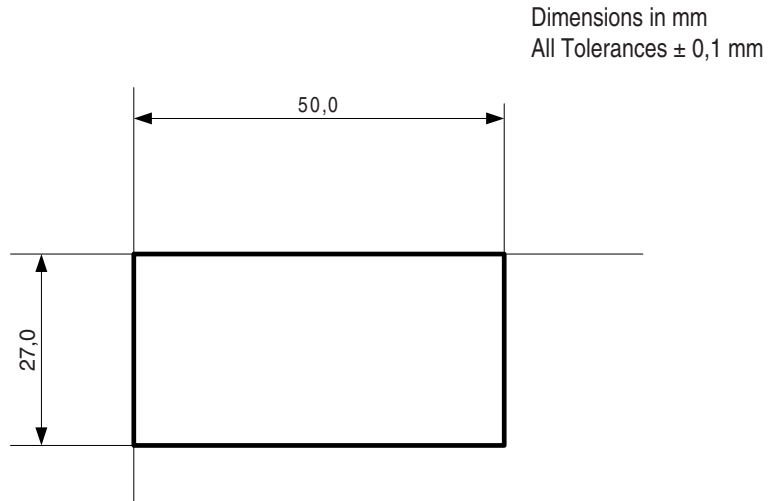


Figure Amd.1-1 — ICC-holder 

A1 4.7.3 Flattening Plate

The flattening plate shall comply with Figure Amd.1-2:

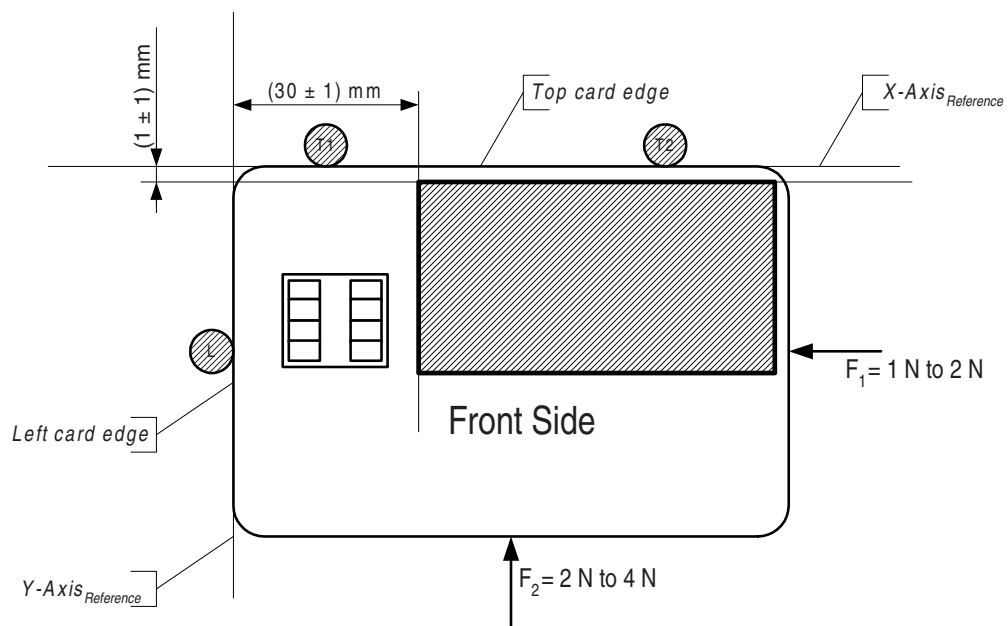


The surface roughness of the flattening plate shall be $R_a < 5 \mu\text{m}$.

Figure Amd.1-2 — Flattening plate

4.7.4 Default Measurement Position

The ICC and the flattening plate shall be mounted on the ICC-holder as shown in Figure Amd.1-3:



F_1 and F_2 are forces applied to the center of the right and the bottom edge of the card respectively to fix the card in the card-holder.

The flattening plate shall apply a force of $2,2 \text{ N} \pm 0,2 \text{ N}$ to the surface of the card

Figure Amd.1-3 — Position of ICC and flattening plate on ICC-holder

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

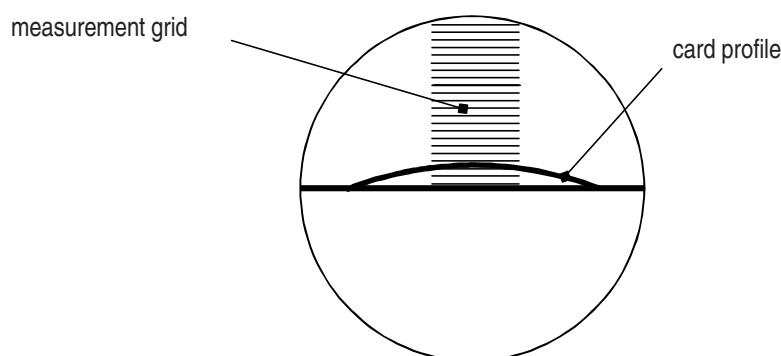


Figure 1 — Projector apparatus view of warpage measurement

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

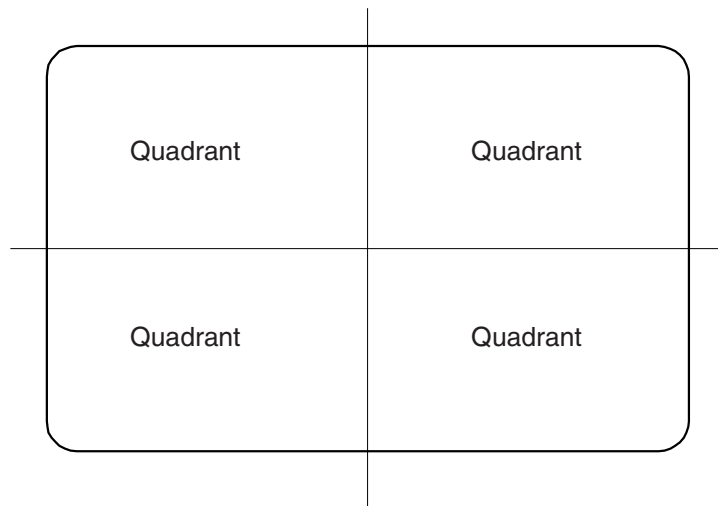


Figure 2 — Assignment of quadrants

5.2.2 Height and width of card measurement

5.2.2.1 Apparatus

The following items are required:

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