INTERNATIONAL STANDARD

ISO/IEC 7810

Second edition
1995-08-15

Identification cards — Physical characteristics

Cartes d'identification — Caractéristiques physiques

Reference number
ISO/IEC 7810:1995(E)

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 the member 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 7810 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Identification cards and related devices*.

This second edition cancels and replaces the first edition (ISO 7810:1985), of which it constitutes a technical revision.

Introduction

This International Standard is one of a series of standards describing the parameters for identification cards as defined in clause 4 and the use of such cards for international interchange.

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Identification cards — Physical characteristics

1 Scope

This International Standard specifies the physical characteristics of identification cards including card materials, construction, characteristics, and dimensions for three sizes of card.

ISO/IEC 10373 specifies the test procedures used to check cards against the parameters specified in this International Standard.

This International Standard specifies the requirements for cards used for identification. It takes into consideration both human and machine aspects and states minimum requirements.

It is the purpose of this series of standards to provide criteria to which cards shall perform, and methods of testing. No consideration is given within these standards to the amount of use, if any, experienced by the card prior to the test. Failure to conform to specified criteria should be negotiated between the involved parties.

NOTE — Numeric values in the SI and/or Imperial measurement system in this International Standard may have been rounded off and therefore are consistent with, but not exactly equal to, each other. Either system may be used, but the two should not be intermixed or reconverted. The original design was made using the Imperial measurement system.

2 Conformance

An identification card is in conformance with this International Standard if it meets all mandatory requirements specified herein.

3 Normative references

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 indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7816-1:1987, *Identification cards — Integrated circuit(s) cards with contacts — Part 1: Physical characteristics.*

ISO/IEC 10373:1993, *Identification cards — Test methods.*

4 Definition

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

4.1 identification card: Card identifying its holder and issuer which may carry data required as input for the intended use of the card and for transactions based thereon.

5 Dimensions of card types

The nominal dimensions of the three sizes of card are shown in table 1.

Table 1 — Nominal dimensions

Card type	Width		Height		Thickness	
	mm	in	mm	in	mm	in
ID-1	85,60	3,370	53,98	2,125	0,76	0,030
ID-2	105,00	4,134	74,00	2,913	0,76	0,030
ID-3	125,00	4,921	88,00	3,465	0,76	0,030

5.1 Card type ID-1

The following dimensions and tolerances apply to cards under the standard test atmosphere of 23 °C ± 3 °C (73 °F ± 5 °F) and 40 % to 60 % relative humidity.

5.1.1 Card width and height

All points on the edges of the card in the finished state, except for the rounded corners, shall fall between two concentric, similarly aligned rectangles which are dimensioned as follows:

Unembossed card:

— Outer rectangle: width 85,72 mm (3,375 in)
height 54,03 mm (2,127 in)

— Inner rectangle: width 85,47 mm (3,365 in)
height 53,92 mm (2,123 in)

See figure 1.

Fully embossed card:

— Outer rectangle: width 85,90 mm (3,382 in)
height 54,18 mm (2,133 in)

— Inner rectangle: width 85,47 mm (3,365 in)
height 53,92 mm (2,123 in)

See figure 2.

5.1.2 Card thickness

The thickness of the card shall be
0,76 mm ± 0,08 mm (0,030 in ± 0,003 in).

See figure 1.

5.1.3 Corners

The corners shall be rounded with a radius of 3,18 mm ± 0,30 mm (0,125 in ± 0,012 in). Care should be taken to avoid misalignment between the rounded corners and the straight edges of the card.

5.1.4 Card edges

Edge burrs normal to the card face shall not exceed 0,08 mm (0,003 in) above the card surface.

6 Card construction

The card may be made of solid, laminated, or bonded materials, with or without inserts.

7 Card materials

The card shall be made of PVC (polyvinyl chloride) and/or PVCA (polyvinyl chloride acetate) or materials having equal or better performance such as polyesters, polyethylenes and polycarbonates. Card insert material may be used. They are not, however, specified in this International Standard and shall not interfere with other requirements specified in this International Standard.

WARNING — Rigid PVC and PVCA are sensitive to the effects of plasticizers which may be incorporated in some flexible plastic materials. Identification cards kept in contact with such flexible plastics may soften, harden, or deform.

8 Card characteristics

8.1 General

The following general characteristics apply to identification cards.

8.1.1 Bending stiffness (for ID-1 cards)

The bending stiffness of the card shall be such that deformations in normal use (bends not creases) can be removed by the recording or printing device without impairing the function of the card. The deformation which occurs when the card is subject to a test load (see ISO/IEC 10373) is defined as:

35 mm (1,38 in) maximum
3 mm (0,51 in) minimum

The card shall return to within 1,5 mm (0,06 in) of its original flat condition within one minute after the load is removed.

8.1.2 Flammability

Resistance to flammability, if required, is specified in the International Standards dealing with the various applications of identification cards.

8.1.3 Toxicity

The card shall present no toxic hazard in the course of normal use.

8.1.4 Resistance to chemicals

The card shall not exhibit any adverse effects in flexure, lamination or physical dimensions when submerged into separate solutions, as described in ISO/IEC 10373.

8.1.5 Card dimensional stability and warpage with temperature and humidity

When exposed to the following temperature and relative humidity:

temperature: - 35 °C and + 50 °C
(- 31 °F and + 122 °F)

relative humidity: 5 % to 95 % with a max wet bulb temperature ≤ 25 °C (77 °F)

the structural reliability shall remain in compliance for dimensional stability and warpage, as specified in clause 5, 8.1.11 and 8.1.12.

NOTE — Environmental temperatures as defined do not mean card temperatures but refer to the environment in which the card is used.

8.1.6 Light

The card and its printed text shall resist deterioration from exposure to light encountered during normal use.

8.1.7 Durability

Durability of the card is not established in this International Standard. It is based on a mutual agreement between the card issuer and the manufacturer.

8.1.8 Delamination

Component layers of material that form the card structure shall be bonded to the extent that any layer shall possess a minimum peel strength of 6 N/cm (3,4 lbf/in). Tearing of the overlay during the test signifies that the bond is stronger than the overlay, which is automatically deemed acceptable.

NOTE — The issuer is warned that the card's artwork design directly influences lamination bond strength. Certain printing inks may prevent the card from meeting the delamination requirement.

8.1.9 Adhesion or blocking

When finished cards, without embossing, are stacked together, the cards shall show no adverse effects such as:

a) delamination
b) discolouration or colour transfer
c) changes to surface finish
d) transfer of material from one card to another
e) deformation

The cards shall be easily separated by hand.

8.1.10 Light transmittance

All machine readable cards shall have an optical transmission density greater than 1,5 on the specified area.

8.1.11 Overall card warpage (card type ID-1, unembossed cards)

Card warpage is any deformation of card flatness. The maximum distance from a flat rigid plate to any portion of the convex surface of an unembossed card immediately prior to embossing shall not be greater than 1,5 mm (0,06 in) including the card thickness.

8.1.12 Card warpage (card type ID-1, embossed cards)

When lying convex side up on a flat rigid plate, the maximum distance from the flat surface to any non-embossed portion of the convex side of an embossed/encoded card immediately prior to issue shall not be greater than 2,5 mm (0,10 in) including the card thickness.

9 Special characteristics

9.1 Embossed cards

For cards that are embossed, special attention shall be paid to the characteristics of the material affecting its suitability for this purpose, particularly in respect to its ability to resist crushing and collapsing of the embossed parts when operating in imprinters.

9.2 Cards with magnetic stripe

The card material shall not contain elements which might migrate into and modify the magnetic material to such an extent that, during normal use of the card, this material is likely to become incapable of meeting the characteristics specified for it in this series of International Standards for identification cards.

9.2.1 Magnetic stripe area warpage (card type ID-1)

Application of a 2,2 N (0,5 lbf) load evenly distributed on the front face opposite the magnetic stripe shall bring the entire stripe within 0,08 mm (0,003 in) of the rigid plate.

9.2.2 Surface distortions (card type ID-1)

In area B minus area A (see figure 3) there shall be no surface distortions, irregularities or raised areas on the front or the back of the card that might interfere with the contact between the magnetic head and magnetic stripe.

If, however, a raised signature panel area is located on the front or back of the card, then regardless of the magnetic stripe width, the following shall apply:

a) When the signature panel is at least 79,88 mm (3,145 in) long and displaced from the right hand edge of the card by not more than 2,92 mm (0,115 in), the raised area shall be no closer to the top edge of the card than 16,76 mm (0,660 in).

b) In all other cases the raised area shall be no closer to the top edge of the card than 19,05 mm (0,750 in).

No raised area shall exceed 0,51 mm (0,020 in) in the embossing area (see area C minus area D).

No raised area shall exceed 0,25 mm (0,010 in) over the entire remaining front or back of the card.

NOTE — Scratching or marking of a signature panel may occur in some reading or encoding devices.

9.2.3 Contamination

The card material and any material added to the card shall not contaminate the devices which encode or read the card.

9.3 Special characteristics for cards with integrated circuits

Refer to ISO 7816-1 for additional characteristics.

Dimensions in millimetres (inches)

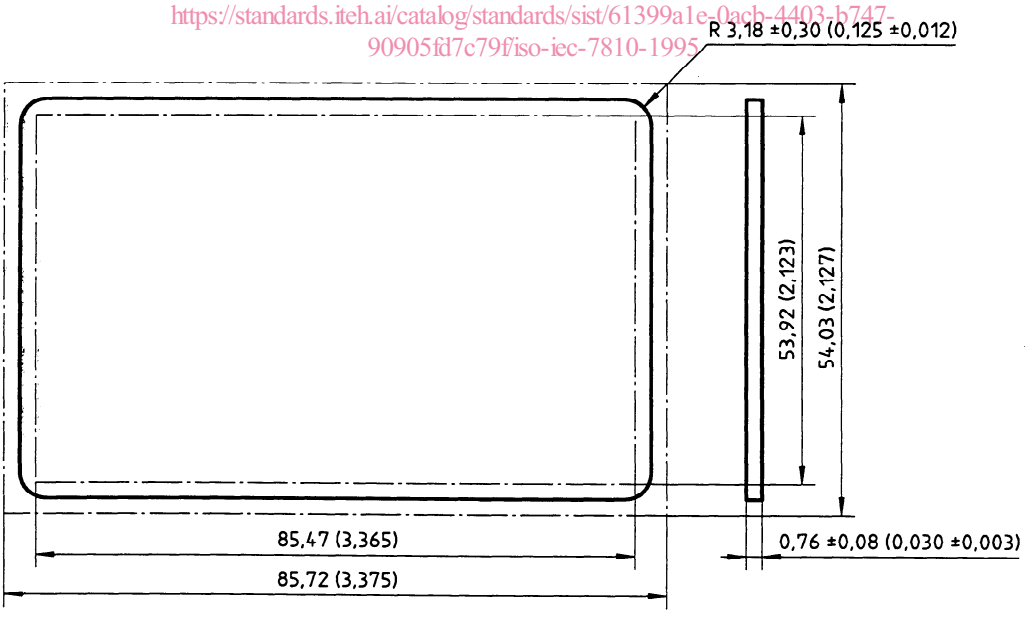
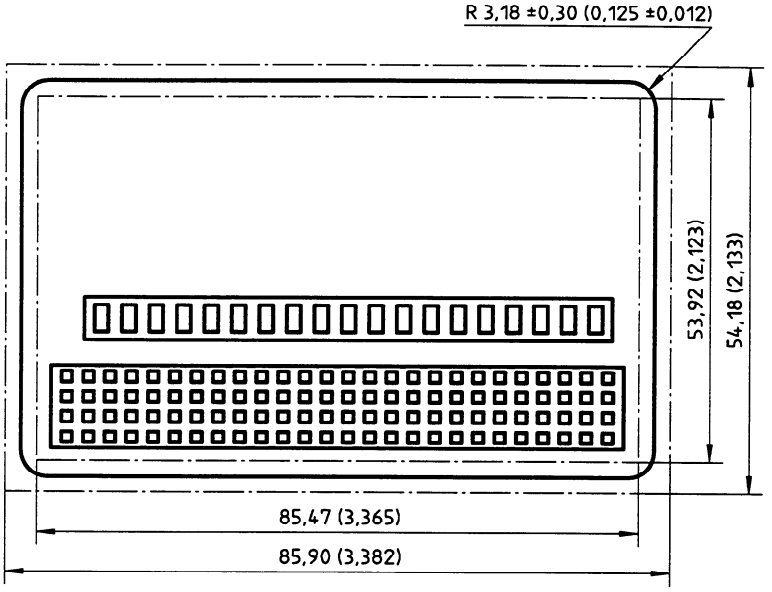


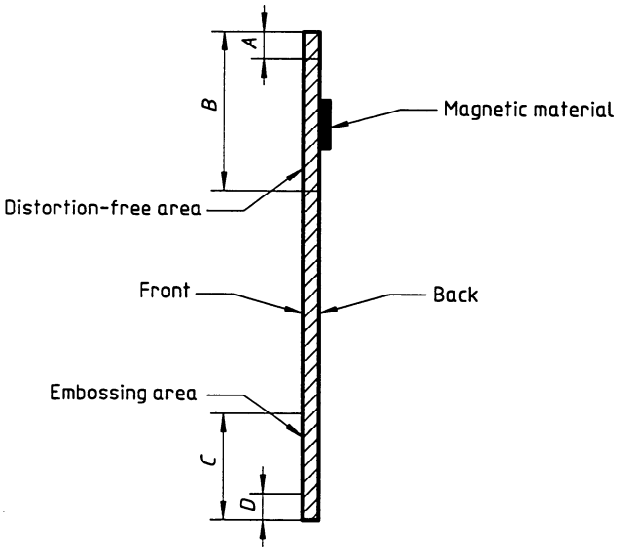
Figure 1 — Card dimensions for unembossed cards

Dimensions in millimetres (inches)



NOTE — When the height of the outer rectangle exceeds 54,10 mm (2,130 in), machine reading problems may occur.

Figure 2 — Card width and height for fully embossed cards



Dimension	mm	in
A max.	2,54	0,100
B min.	19,05	0,750
C max.	24,03	0,946
D min.	2,54	0,100

Figure 3 — Locations of areas defining allowable surface distortions for ID-1 card