INTERNATIONAL STANDARD 1682

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Information processing — 80 Columns punched paper cards — Dimensions and location of rectangular punched holes

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

As part of this process, Technical Committee ISO/TC 97, *Computers and information processing,* has reviewed ISO Recommendation R 1682-1971 and found it technically suitable for transformation. International Standard ISO 1682 therefore replaces ISO Recommendation R 1682-1971, which was approved by the Member Bodies of the following countries :

Australia	Greece	Romania
Belgium	Israel	Spain
Brazil	Italy	Sweden
Canada	Japan	Switzerland
Czechoslovakia	New Zealand	Thailand
Egypt, Arab Rep. of	Peru	Turkey
France	Poland	United Kingdom
Germany	Portugal	U.S.A.

No Member Body expressed disapproval of the Recommendation.

Printed in Switzerland

Information processing — 80 Columns punched paper cards — Dimensions and location of rectangular punched holes

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the dimensions and location of rectangular punched holes in 80 columns punched paper cards for information interchange.

NOTE — The properties of unpunched paper cards are specified in ISO 1681, *Information processing — Unpunched paper cards — Specification.*

2 DIMENSIONS AND POSITION OF HOLES (see figure)

2.1 Principle

A theoretical grid should be constructed as follows :

2.1.1 Reference line X is the line lying along the top edge of the card; that is to say, the outer of the two closest parallel straight lines wholly containing the contour of the top edge of the card.

For the purpose of locating a reference point on the edge of a card, a point on the edge of a card shall be the centre of a line 10 mm (0.375 in) in length on a flat, contacting, metal surface at least 10 mm (0.375 in) long which is being pressed against the edge of the card with a force of approximately 50 mN per millimetre of its length in contact with the card.[1)]

2.1.2 There shall be twelve horizontal grid lines spaced 6,350 mm (0.250 in) apart; the topmost grid line shall be 6,350 mm (0.250 in) from the reference line X.

2.1.3 Reference line Y is at right angles to the reference line X, intersecting the reference point located on the right-hand edge of the card at a distance of 41,275 mm (1.625 in) from the reference line X.

2.1.4 There shall be 80 vertical grid lines spaced 2,209 8 mm (0.087 in) apart; the extreme right-hand grid line (column 80 of the card) shall be 6,375 mm (0.251 in) from the reference line Y.

2.2 Shape of holes

The punched holes should be nominally rectangular.

2.3 Dimensions of holes

All edges of the hole shall fall between two concentric, similarly aligned rectangles whose edges are parallel to the reference lines X and Y. The dimensions of the rectangles are as follows :

— outer :
height 3,200 mm (0.126 in)
width 1,422 mm (0.056 in)

— inner :
height 3,150 mm (0.124 in)
width 1,372 mm (0.054 in)

1) In common practice, this value is equivalent to 5 gf/mm.

2.4 Nominal location of holes

All holes should nominally centre on the intersections of the horizontal and vertical grid lines.

2.5 Tolerances on location of holes

Tolerances shall apply under the following conditions :

2.5.1 *Minimum bridge width*

The distance between the nearest edges of two adjacent holes in the same horizontal row measured parallel to the reference line X shall not be less than 0,508 mm (0.020 in).

2.5.2 *Punching tolerances*

Because changes in environment affect the dimensions of paper cards (see annex), the centre lines of each hole should be within 0,254 mm (0.010 in) of their corresponding longitudinal and transverse grid lines at the time of punching.

2.5.3 *Reading tolerances*

The centre lines of each hole shall be within 0,457 mm (0.018 in) of their corresponding longitudinal and transverse grid lines at the time of reading.

3 ENVIRONMENTAL CONDITIONS

This International Standard does not specify the environment; this should be agreed between those responsible for punching, reading, transporting and storing cards. Particular attention is drawn to the fact that problems may arise if a card is punched several times and under different conditions.

Dimensions in millimetres
(inch values in parentheses)

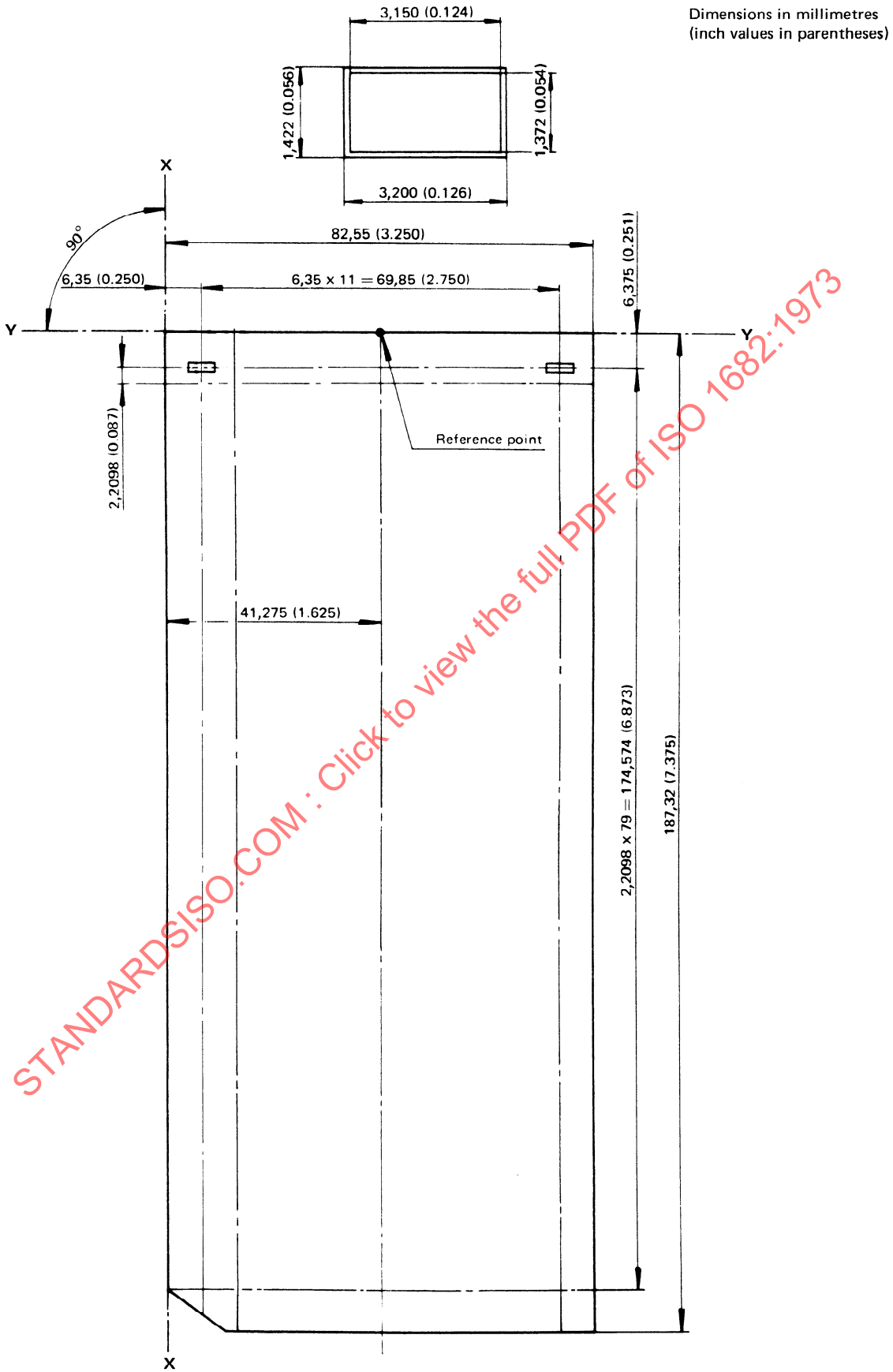

FIGURE — **Detail requirements**

ANNEX

STORAGE AND USE OF PUNCHED CARDS

Cards should be stored and used under the following conditions :

— *storage* :

Relative humidity between 30 and 65 %; temperature between 5 and 50 °C (41 and 122 °F).

— *use* :

Relative humidity 50 ± 10 %; normal temperature of use between 18 and 24 °C (65 and 75 °F).

Recommendations are classified under the three following sections :

1. Climatic conditions :

   1.1 Importance of climate for cards
   1.2 Ambient conditions for working and storage areas
   1.3 Acclimatization of cards

2. Storage procedures

3. Card handling

and it is strongly recommended to follow the few procedures that are listed below.

A.1 CLIMATIC CONDITIONS

A.1.1 Importance of climate for cards

Without proper precautions, cards will be affected by heat, cold and, most significantly, by humidity. Variations in the humidity will alter the card's size and mass by changing its moisture content, and may cause warping, the most frequent source of card trouble in data processing installations.

More precise indications of the effects of humidity are as follows :

Dimensions : When humidity is high, moisture is absorbed by cards, usually causing them to swell in length, width and thickness. When humidity is low, cards lose moisture and shrink in all dimensions. For instance, a variation of relative humidity from 20 to 75 % or from 75 to 20 % may cause variations of card dimensions up to 0,46 mm (0.018 in) in length and 0,58 mm (0.023 in) in width.

A new card does not return to its original dimensions when brought back to the initial conditions of measurement after exposure to a wide variation or high level of relative humidity. For instance, a card exposed to a relative humidity higher than 70 % may become permanently deformed, causing the card to be out of tolerance. It is therefore recommended to stay under 65 % relative humidity for storage.

Warp : A card exposed to a relative humidity beyond the extremes of 40 to 60 % may become temporarily, or even permanently, warped; it has a tendency to warp, in particular, when the relative humidity is low. Even when keeping it within these limits, an abrupt change in relative humidity may cause a temporary warp. In this case, the stresses that cause warp will usually disappear as soon as the card has reached a moisture balance with its new surroundings.

NOTE — Inherent warp on cards may be found, but very rarely; it cannot be corrected and is even increased when the cards have been exposed to extreme humidity levels.

However, when the recommended ambient conditions for the storage and use have been complied with, the dimensional changes and the distortion of cards at their time of use are comparatively minor.

A.1.2 Ambient conditions for working and storage areas

From what has just been stated, it results that :

— the relative humidity levels and the temperatures of working and storage areas must be taken into account : it is recommended that they should be recorded;

— it would be desirable that the relative humidity to which cards are exposed be maintained constant : abrupt changes are particularly to be avoided.

In fact, it is possible to maintain to the desirable levels the humidity of almost every working area, except perhaps when the outside temperature is extreme or the humidity very high; great care must be exercised in regulating thermostats and hygrostats;

— in winter, a favourable relative humidity in the machine room is more easily maintained at lower temperatures. Continuous high heat dries the air and may cause a drop in recommended humidity levels;

— in summer, an excessive relative humidity may be reduced by the use of de-humidifiers.

It must be pointed out, however, that there are often very great variations in the atmosphere of one room, particularly near pipes, radiators, or open windows, and cards should not be stored near any of these. Care must be exercised in opening and closing windows. The cards should not be placed directly on the floor, particularly if the floor is other than a wooden one, or against a wall, as local conditions of cold and high humidity often occur at such a point. The method of heating is immaterial provided that systems are not used which put noxious fumes and water vapour into the air.