
International Standard



5654 / 1

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Information processing — Data interchange on 200 mm (8 in) flexible disk cartridges using two-frequency recording at 13 262 ftprad, 1,9 tpmm (48 tpi), on one side — Part 1 : Dimensional, physical and magnetic characteristics

Traitement de l'information — Échange d'information sur cartouches à disquette de 200 mm (8 in) utilisant un enregistrement à deux fréquences à 13 262 ftprad, 1,9 tpmm (48 tpi), sur une face — Partie 1 : Caractéristiques dimensionnelles, physiques et magnétiques

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Foreword

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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.

International Standard ISO 5654/1 was developed by Technical Committee ISO/TC 97, *Computers and information processing*, and was circulated to the member bodies in June 1980.

It has been approved by the member bodies of the following countries :

Australia	Iraq	South Africa, Rep. of
Canada	Italy	Spain
Cuba	Japan	Sweden
Czechoslovakia	Mexico	Switzerland
Finland	Netherlands	United Kingdom
France	New Zealand	USSR
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The member bodies of the following countries expressed disapproval of the document on technical grounds :

Belgium
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Information processing — Data interchange on 200 mm (8 in) flexible disk cartridges using two-frequency recording at 13 262 ftprad, 1,9 tpmm (48 tpi), on one side —

Part 1 : Dimensional, physical and magnetic characteristics

0 Introduction

ISO 5654 specifies the characteristics of 200 mm (8 in) flexible disk cartridges recorded at 13 262 ftprad on one side using two-frequency recording.

ISO 5654/2 specifies the quality of recorded signals, track layout, and the track format.

Together with the labelling scheme specified in ISO 7665, ISO 5654/1 and ISO 5654/2 provide for full data interchange between data processing systems.

1 Scope and field of application

This part of ISO 5654 specifies the dimensional, physical and magnetic characteristics of the cartridge, so as to provide physical interchangeability between data processing systems.

NOTE — Numeric values in the SI and/or Imperial measurements system in this International Standard may have been rounded and therefore are consistent with, but not exactly equal to, each other. Either system may be used, but the two should be neither intermixed nor reconverted. The original design was made using the Imperial measurement system.

2 References

ISO 646, *Information processing — 7-bit coded character set for information interchange*.¹⁾

ISO 2022, *Information processing — ISO 7-bit and 8-bit coded character sets — Code extension techniques*.²⁾

ISO 4873, *Information processing — 8-bit coded character set for information interchange*.

ISO 7665, *Information processing — File structure and labelling of flexible disk cartridges for information interchange*.³⁾

3 Definitions

For the purpose of this International Standard, the following definitions apply :

3.1 flexible disk : Flexible disk which accepts and retains, on the specified side or sides magnetic signals intended for input/output and storage purposes of information data processing and associates systems.

3.2 reference flexible disk cartridge : Flexible disk cartridge arbitrarily selected for a given property for calibrating purposes.

3.3 secondary reference flexible disk cartridge : Flexible disk cartridge intended for routine calibrating purposes, the performance of which is known and stated in relation to that of the reference flexible disk cartridge.

3.4 signal amplitude reference flexible disk cartridge : Reference flexible disk cartridge selected as a standard for recording field and signal amplitude.

NOTE — A master standard for signal amplitudes, reference fields, overwrite and resolution characteristics has been established by the Physikalisch-Technische Bundesanstalt (PTB), Bundesallee 100, in Braunschweig, Germany. Secondary reference flexible disk cartridges can be ordered from PTB under part number RM 5654 as long as available.

3.5 typical field : The minimum recording field which, when applied to a flexible disk cartridge, causes a signal output equal to 95 % of the maximum average signal amplitude when taken as a function of the recording field at the specified track and flux transition frequency of that flexible disk cartridge.

3.6 reference field : The typical field of the signal amplitude reference flexible disk cartridge.

1) At present at the stage of draft. (Revision of ISO 646-1973.)

2) At present at the stage of draft. (Revision of ISO 2022-1973.)

3) At present at the stage of draft.

3.7 test recording currents : The two recording currents between 145 % and 155 % of the currents which produce the reference field at 250 000 flux transitions per second (ftps) on track 00 and track 76 respectively. The first of these currents shall be used for recording on tracks 00 to 43. The second current shall be used for recording on tracks 44 to 76 (see also 8.2).

3.8 standard reference amplitudes : The average signal amplitudes derived from the signal amplitude reference flexible disk cartridge at the density obtained when writing with 250 000 ftps on track 00 and with 500 000 ftps on track 76 using the appropriate test recording current for the track under test (see also 8.2).

3.9 average signal amplitude : The arithmetically-averaged value for a track of the output voltage measured peak-to-peak over the whole track.

3.10 in contact : An operating condition in which the magnetic surface of the disk intended for data storage is in physical contact with the magnetic head.

3.11 formatting : Writing the proper control information establishing the 77 physical tracks and designating the addresses of physical records on the flexible disk's surfaces.

3.12 initialization : Writing of the volume label, the ERMAP label, and any other information initially required to be on the flexible disk cartridge prior to the commencement of general processing or use.

3.13 recording area : That area of the disk surface with which the head may come into contact.

4 General description

4.1 General figures

A typical flexible disk cartridge is represented in figures 1 to 3 as follows :

- figure 1 shows the cartridge seen from above, side 0 up;
- figure 2 shows section A-A which is a cross-section along the line A-A in figure 1;
- figure 3 shows a protective envelope with cartridge, side 1 up.

4.2 Main elements

The main elements of this flexible disk cartridge are :

- the recording disk;
- the liner;
- the jacket.

The cartridge is stored in an envelope.

4.3 Description

The jacket is of a square form. It includes a central window, an index window and a head window in both sides.

The liner is fixed to the inside of the jacket. It comprises two sheets of material between which the disk is held. The liner has the same openings as the jacket.

The disk has only a central hole and an index hole.

4.4 Optional features

The interchange characteristics of the jacket allow for variations of its construction. It may include flaps, (for example, three flaps as shown in the drawings, or none), and notches along the reference edge. For conditions under which a write-inhibit notch may be used, see annex D.

5 General requirements

5.1 Environment and transport

5.1.1 Testing environment

Tests and measurements made on the cartridge to check the requirements of this International Standard shall be carried out under the following conditions :

- temperature : 23 ± 2 °C (73 ± 4 °F);
- relative humidity : 40 to 60 %;
- conditioning before testing : 24 h minimum.

The temperature and the relative humidity shall be measured in the air immediately surrounding the cartridge.

The stray magnetic field at any point on the disk surface, including that resulting from the concentrating effect of the recording head shall not exceed 4 000 A/m (50 Oe).

5.1.2 Operating environment

Cartridges used for data interchange shall be operated under the following conditions :

- temperature : 10 to 50 °C (50 to 122 °F);
- relative humidity : 20 to 60 %;
- wet bulb temperature : < 29 °C (84 °F).

The temperature and the relative humidity shall be measured in the air immediately surrounding the cartridge. It is recommended that the rate of change of the temperature should not exceed 20 °C (36 °F) per hour.

There shall be no deposit of moisture on or in the cartridge.

The stray magnetic field at any point on the disk surface, including that resulting from the concentrating effect of the recording head shall not exceed 4 000 A/m (50 Oe).

5.1.3 Storage environment

During storage, it is recommended that the cartridges are kept with the following conditions :

- temperature : 4 to 53 °C (40 to 127 °F);
- relative humidity : 8 to 80 %.

Each cartridge shall be in an envelope and in an upright position.

The ambient stray magnetic field shall not exceed 4 000 A/m (50 Oe).

NOTE — Cartridges which have been exposed to temperatures and humidities outside the operating condition may exhibit degraded performance characteristics. Such cartridges should be subjected to a conditioning period of not less than 24 h within the operating environment prior to use.

5.1.4 Transportation

Responsibility for ensuring that adequate precautions are taken during transportation shall be with the sender. During transportation, the cartridge shall be in its envelope, and in a protective package. The latter must be free from dust or extraneous matter. It must have a clean interior and a construction that prevents ingress of dust and water. It is recommended that a sufficient space exists between cartridge and outer surface of the final container, so that risk of damage due to stray magnetic fields will be negligible.

It is recommended that the following conditions should not be exceeded :

- temperature : -40 to 53 °C (-40 to 127 °F);
- maximum rate of temperature change : 20 °C (36 °F) per hour;
- relative humidity : 8 to 90 %.

No moisture shall condense in or on the cartridge.

5.1.5 Handling

The cartridge shall stay out of its envelope for the shortest time possible. When handling the cartridge, the operator shall not touch the exposed magnetic surfaces of the disk and shall avoid exposing the cartridge to direct sunlight, moisture and dust.

5.2 Materials

5.2.1 Jacket

The jacket may be constructed from any suitable material.

5.2.2 Liner

The material of the liner shall be able to retain dust without damage to the disk.

5.2.3 Disk

The disk may be constructed from any suitable material (for example, bi-axially oriented polyethylene terephthalate) coated at least on one side with a strong and flexible layer of magnetic material (for example, γ -Fe₂O₃).

5.2.4 Envelope

The envelope may be manufactured from any suitable material (for example, paper).

5.3 Direction of rotation

The direction of rotation shall be counterclockwise when looking at side 0.

6 Dimensional characteristics

The dimensional characteristics listed in sub-clauses below are indicated in figures 4 to 7 as follows :

- figure 4 shows the jacket;
- figure 5 shows a partial cross-section of the jacket;
- figure 6 shows the disk;
- figure 7 shows a cross-section of the disk.

All dimensions are referred to the reference edge of the cartridge (see figure 4).

6.1 Jacket

6.1.1 Form

The jacket is of a square form with angles of $90^\circ \pm 30'$ and a side length :

$$l_1 = 203,2 \pm 0,4 \text{ mm } (8.000 \pm 0.015 \text{ in})$$

6.1.2 Thickness

6.1.2.1 Jacket wall and liner

In an area defined by :

$$r_1 = 60 \text{ mm } (2.36 \text{ in})$$

$$r_2 = 85 \text{ mm } (3.35 \text{ in})$$