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**Information processing systems — Data interchange on 90 mm (3,5 in) flexible disk cartridges using modified frequency modulation recording at 15 916 ftprad, on 80 tracks on each side —**

iTeh STANDARD PREVIEW

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Dimensional, physical and magnetic characteristics

ISO/IEC 9529-1:1989

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*Systèmes de traitement de l'information — Échange de données sur cartouches à disquette de 90 mm (3,5 in) utilisant un enregistrement à modulation de fréquence modifiée à 15 916 ftprad sur 80 pistes sur chaque face —*

*Partie 1: Caractéristiques dimensionnelles, physiques et magnétiques*



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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) together form a system for worldwide standardization as a whole. 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 approval before their acceptance as International Standards. They are approved in accordance with procedures requiring at least 75 % approval by the national bodies voting.

ISO/IEC 9529-1:1989

International Standard ISO/IEC 9529-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

## Introduction

ISO/IEC 9529 specifies the characteristics of 90 mm (3,5 in) flexible disk cartridges recorded at 15 916 ftprad using modified frequency modulation recording on, 80 tracks on each side.

ISO/IEC 9529-2 specifies the track layout, the track format and the characteristics of the recorded signals.

ISO/IEC 9529-1 and ISO/IEC 9529-2, together with the labelling scheme specified in ISO 9293, provide for full data interchange between data processing systems.

In accordance with ISO/IEC 9983<sup>1)</sup>, flexible disk cartridges conforming to this part of ISO/IEC 9529 should be designated as “ISO Type 302”.

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1) ISO/IEC 9983 : 1989, *Information processing systems — Designation of unrecorded flexible disk cartridges.*

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# Information processing systems — Data interchange on 90 mm (3,5 in) flexible disk cartridges using modified frequency modulation recording at 15 916 ftprad, on 80 tracks on each side —

## Part 1: Dimensional, physical and magnetic characteristics

### 1 Scope

This part of ISO/IEC 9529 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 measurement system in this part of ISO/IEC 9529 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 be neither intermixed nor reconverted. The original design was made using SI units.

### 2 Conformance

A 90 mm (3,5 in) flexible disk cartridge shall be in conformance with this part of ISO/IEC 9529 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 part of ISO/IEC 9529. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 9529 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 683-13:1986, *Heat treatable steels, alloy steels and free-cutting steels - Part 13: Wrought stainless steels.*

ISO 9293:1987, *Information processing - Volume and file structure of flexible disk cartridges for information interchange.*

## 4 Definitions

For the purpose of ISO/IEC 9529 the following definitions apply.

**4.1 recording disk:** A flexible disk which accepts and retains, on the specified side or sides, magnetic signals intended for input/output and storage purposes.

**4.2 hub:** A centring and referencing device attached to the centre of the disk which allows torque to be transmitted to the disk. It ensures centring of the disk on the drive shaft in a unique angular position.

**4.3 shutter:** A device which uncovers the head windows upon insertion, and automatically covers them upon removal from the drive.

**4.4 liner:** Suitable material positioned between the case and the disk to provide cleaning action and protection from abrasion.

**4.5 case:** A protective enclosure including a shutter mechanism, a write-inhibit hole and an identification hole.

**4.6 Master Standard Reference Flexible Disk Cartridge:** A reference flexible disk cartridge selected as the standard for reference fields, signal amplitudes, resolution, peak shift and overwrite. Track 00 and Track 79 (on both sides) are declared as reference tracks.

The reference tracks are calibrated at 300 r/min.

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NOTE - This Master Standard has been established by the Physikalisch-Technische Bundesanstalt (PTB), Bundesallee 100, D-3300 Braunschweig, Germany, F.R.

**4.7 Secondary Standard Reference Flexible Disk Cartridge:** A flexible disk cartridge the performance of which is known and stated in relation to that of the Master Standard Reference Flexible Disk Cartridge.

NOTE - Secondary Standard Reference Flexible Disk Cartridges can be ordered from PTB Lab. 1.41 under Part Number RM 9529 until 1997.

It is intended that these be used for calibrating tertiary cartridges for use in routine calibration.

**4.8 Typical Field:** In the plot of average signal amplitude against recording field at the specified track and flux transition density, the Typical Field is the minimum field which causes an average signal amplitude equal to 95% of the maximum Average Signal Amplitude.

**4.9 Reference Field:** The Reference Field is the typical field of the Master Standard Reference Flexible Disk Cartridge. There are two Reference Fields, one for each side.

**4.10 Test Recording Current:** The Test Recording Current is the current between 148% and 152% of the current which produces the Reference Field at Test Frequency 1f on Track 00. There are two Test Recording Currents, one for each side.

**4.11 Standard Reference Amplitude:** The Standard Reference Amplitudes (SRAs) are the

Average Signal Amplitudes derived from the reference tracks of the Master Standard Reference Flexible Disk Cartridge using the Test Recording Current.

There are four SRAs, two for each side.

SRA<sub>1f</sub> is the Average Signal Amplitude from a recording written using Test Frequency 1f at Track 00. SRA<sub>2f</sub> is the Average Signal Amplitude from a recording written using Test Frequency 2f at Track 79.

**4.12 Average Signal Amplitude:** The Average Signal Amplitude for a track is the arithmetically averaged value of the output voltages measured peak-to-peak over the whole track.

**4.13 in-contact:** An operating condition in which the magnetic surface of the disk is in physical contact with the magnetic heads.

**4.14 side:** Side 0 is the side engaged by the spindle. Side 1 is the opposite side.

**4.15 direction of rotation:** The direction of rotation shall be counter-clockwise when looking at Side 0.

**4.16 Index:** The Index is the point on a track which determines the beginning and the end of the track.

**4.17 line of access:** The straight line described by the centre of the gap of the read/write head as it is positioned from Track 00 to Track 79.

**4.18 formatting:** Writing the proper control information establishing the physical cylinders and the addresses of physical records on the surfaces of the flexible disk.

**4.19 initialization:** Writing any information initially required to be on the flexible disk cartridge, e.g. the Volume Label, prior to the commencement of general processing use.

## 5 General description

### 5.1 Drawings

In the enclosed drawings

- Figure 1 shows Side 0 and enlarged cross-sections through the location holes;
- Figure 2 shows Side 1;
- Figure 3 shows at a larger scale the upper part of Side 0 without shutter;
- Figure 4 shows the disk with hub; and
- Figure 5 shows the interface between the cartridge and the drive.

## 5.2 Main Elements

The main elements of the flexible disk cartridge are

- the recording disk;
- the liner;
- the case.

## 5.3 Description

The cartridge is of a substantially square form. It includes a central hole on one side, head windows on both sides, a write-inhibit hole and an identification hole.

The liner is provided between the case and the disk. It comprises two layers of material between which the disk lies.

The disk has a central hole with a metal hub attached.

## 6 General requirements

### 6.1 Environment and Transportation

#### 6.1.1 Testing environment

Tests and measurements made on the cartridge to check the requirements of ISO/IEC 9529 shall be carried out under the following conditions:

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

For the tests specified in 9.3 the temperature and relative humidity shall be measured in the air immediately surrounding the cartridge drive. For all other tests the temperature and 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).

#### 6.1.2 Operating environment

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

- temperature : 10 °C to 51.5 °C (50 °F to 125 °F)
- relative humidity : 20% to 80%
- wet bulb temperature : less than 29 °C (85 °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, and that the temperature and relative humidity conditions when reading a cartridge are not at the opposite extreme to the conditions when it was recorded.

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).

### 6.1.3 Storage environment

During storage the cartridges shall be kept within the following conditions:

|                   |                                   |
|-------------------|-----------------------------------|
| temperature       | : 4 °C to 53 °C (39 °F to 127 °F) |
| relative humidity | : 8% to 90%                       |

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

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

NOTE - Cartridges which have been stored at temperatures and humidities outside the operating conditions 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.

### 6.1.4 Transportation <https://standards.iteh.ai/catalog/standards/sist/38e1641c-169c-49ad-99e1-4b597fc897ab/iso-iec-9529-1-1989>

Responsibility for ensuring that adequate precautions are taken during transportation shall be with the sender. The cartridge shall be in a protective package free from dust or extraneous matter. It is recommended that a sufficient space exists between cartridge and outer surface of the final container, so that risk of erasure due to stray magnetic fields will be negligible.

It is recommended that the following conditions are not exceeded:

|                                       |  |
|---------------------------------------|--|
| temperature                           | : - 40 °C to 60 °C (- 40 °F to 140 °F) |
| maximum rate of<br>temperature change | : 20 °C (36 °F) per hour               |
| relative humidity                     | : 8% to 90%                            |

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

## 6.2 Materials

### 6.2.1 Case

The case shall be constructed from any suitable material such that it meets the requirements of annex A.