

**Implementation of
ISO/IEC 10149:1989**

Information technology — Data interchange on read-only 120 mm optical data disks (CD-ROM)

This European Standard EN 30149:1991 has the status of a
British Standard

UDC 681.327.28

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- British Computer Society
- British Telecommunications plc
- Department of Trade and Industry (National Physical Laboratory)
- EEA (The Electronics and Business Equipment Association)
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National foreword

This British Standard reproduces verbatim ISO IEC 10149:1989 and implements it as the UK national standard.

ISO/IEC 10149:1989 was accepted as a European Standard by the European Committee for Standardization (CEN) in March 1991. This European Standard is designated EN 30149:1991 and is entitled “*Information processing systems — Data interchange on read-only 120 mm optical data disks (CD-ROM)*”.

This British Standard is published under the direction of the Information Technology Systems Standards Policy Committee whose Technical Committee IST 4 has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international committee any enquiries on interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, page 2, the ISO/IEC title page, pages ii to vi, pages 1 to 34 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

UDC 681.327.68 CD-ROM

Descriptors: Data processing, information interchange, data processing devices, optical disk, CD-ROM

English version

Information processing systems — Data interchange on read-only 120 mm optical data disks (CD-ROM)

(ISO/IEC 10149, September 1989)

Technologies de l'information —
Echange de données sur des disques
optiques de diamètre 120 mm à lecture
unique (CD-ROM)
(ISO/IEC 10149, Septembre 1989)

Informationsverarbeitungssysteme —
Datenaustausch auf 120 mm optischen
Datenspeichern mit Nurlese-Zugriff
(CD-ROM)
(ISO/IEC 10149, September 1989)

This European Standard was approved by CEN on 13 March 1991 and is identical to the ISO standard as referred to.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in one official version (English). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

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Foreword

The ISO/IEC DIS 10149 “*Information processing systems — Data interchange on read-only 120 mm optical data disks (CD-ROM)*” was accepted by CEN/CENELEC as a European Prestandard on 1989-01-20.

Following publication of Edition 1 of the above ISO/IEC standard on 1989-09-01, it was decided to submit that document to formal vote as prEN.

In December 1990, the result of the formal vote was positive. The CEN members have been informed of the acceptance of this EN.

For the time being, this document exists only in the English version.

According to the CEN/CENELEC Common Rules, the following countries are bound to implement this standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The Text of the ISO/IEC 10149:1989 was approved by CEN as a European Standard without any modification.

**Information technology — Data interchange on
read-only 120 mm optical data disks (CD-ROM)**

*Technologies de l'information — Échange de données sur des disques optiques de
diamètre 120 mm à lecture unique (CD-ROM)*



Reference number
ISO/IEC 10149 : 1989 (E)

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Descriptors: Data processing, information interchange, data storage devices, read only memories, optical disks, specifications, track formats.

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.

International Standard ISO/IEC 10149 was prepared by the European Computer Manufacturers Association (as ECMA-130) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

Annex A to Annex E form an integral part of this International Standard. Annex F is for information only.

Introduction

In this International Standard

- clauses 1 to 3 identify and introduce the contents of the standard;
- clause 4 gives definitions and clauses 5, 6 and 7 specify requirements for environments, flammability and material respectively;
- clauses 8 to 12 specify the characteristics of the disk;
- clause 12 deals with optical signals;
- clauses 13 to 19 describes recording;
- clauses 20 to 22 specify the format of the information area.

1 Scope

This International Standard specifies the characteristics of 120 mm optical disks for information interchange between information processing systems and for information storage, called CD-ROM.

The optical disk specified by this International Standard is of the type in which the information is recorded before delivery to the user and can only be read from the disk. This International Standard specifies

- some definitions, the environments in which the characteristics of the disk shall be tested and the environments in which it shall be used and stored;
- the mechanical, physical, and dimensional characteristics of the disk;
- the recording characteristics, the format of the tracks, the error-detecting and the error-correcting characters, and the coding of the information;
- the optical characteristics for reading the information.

The characteristics are specified for tracks recorded with digital data. According to this International Standard, a disk may also contain one or more tracks recorded with digital audio data. Such tracks shall be recorded according to IEC 908.

2 Conformance

An optical disk is in conformance with this International Standard if it conforms to all its mandatory requirements.

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 9660:1988, *Information processing — Volume and file structure of CD-ROM for information interchange*.

IEC 908:1987, *Compact disc digital audio system*.

4 Definitions

For the purposes of this International Standard, the following definitions apply.

4.1

audio track

an Information Track containing digitally encoded audio information

4.2

concentricity

the diameter of a circular tolerance zone within which the centres of two circular features must lie

4.3

control byte

an 8-bit byte from a table of 98 bytes, added to an F₂-Frame and containing addressing information

4.4

digital data track

an Information Track organized in sectors and containing digital user data

4.5

F₁-Frame

a group of 24 8-bit bytes, being the output of the scrambler and input of the CIRC encoder

4.6

F₂-Frame

a group of 32 8-bit bytes, being the output of the CIRC encoder

4.7

F₃-Frame

a group of 33 8-bit bytes, being an F₂-Frame with a control byte, and input of the 8-to-14 encoder

4.8

information area

an area on the disk with physical tracks, consisting of a Lead-in area, User Data area and a Lead-out area

4.9

information track

an area on the disk containing a collection of user information

4.10

physical track

a 360° turn of a continuous spiral line on the disk, followed by the optical stylus

4.11

radial acceleration

the radial acceleration of any physical track in the direction perpendicular to the axis of rotation of the disk, at a specified rotational speed

4.12

radial runout

the difference between the maximum and the minimum distance of a physical track to the axis of rotation measured over one revolution

4.13

section

a group of 98 F₃-Frames containing one complete table of Control bytes

4.14

sector

the smallest addressable part of a Digital Data Track in the information area that can be accessed independently of other addressable parts of the area

4.15

user data area

a part of the information area containing User Data

5 Environments

5.1 Testing environments

5.1.1 *Optical stylus*

The optical stylus used for testing measurements shall have the following characteristics:

wavelength λ :	780 nm $\pm$ 10 nm
polarization:	circular
numerical aperture:	0,45 $\pm$ 0,01
intensity at the rim of the pupil of the objective lens:	larger than 50 % of the maximum intensity value

The rms wave front error of the beam near the information layer shall be less than 0,07 λ . The contribution of the disk to this error shall be less than 0,05 λ .

5.1.2 *Clamping*

Where applicable, the disk shall be held between two concentric rings having an inner diameter of at least 29 mm and an outer diameter of at most 31 mm holding the disk with a force in the range 1 N to 2 N.

5.1.3 *Normal testing environment*

Unless otherwise stated, tests and measurements made on the disk to check the requirements of this International Standard shall be carried out under the following conditions:

temperature:	25 °C $\pm$ 10 °C
relative humidity:	45 % to 75 %
atmospheric pressure:	96 kPa $\pm$ 10 kPa
conditioning before testing:	24 h min.

No condensation on the disk shall be permitted to occur.

5.1.4 *Restricted testing environment*

Where specifically stated, tests and measurements shall be carried out under the following conditions:

temperature:	23 °C $\pm$ 2 °C
relative humidity:	45 % to 55 %
atmospheric pressure:	96 kPa $\pm$ 10 kPa
conditioning before testing:	24 h min.

No condensation on the disk shall be permitted to occur.

5.2 Operating environment

Disks used for data interchange shall be operated under the following conditions, when mounted in the drive supplied with voltage and measured on the outside surface of the disk.

The disk exposed to storage conditions must be conditioned in the operating environment for at least 2 h before operating.

temperature:	– 25 °C to + 70 °C
relative humidity:	10 % to 95 %
absolute humidity:	0,5 g m ⁻³ to 60 g m ⁻³
sudden change of temperature:	50 °C max.
sudden change of relative humidity:	30 % max.

There shall be no condensation of moisture on the disk.