

INTERNATIONAL
STANDARD

ISO/IEC
13490-1

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1995-12-15

**Information technology — Volume and file
structure of read-only and write-once
compact disk media for information
interchange —**

Part 1:
General

[ISO/IEC 13490-1:1995](https://standards.iteh.ai/catalog/standards/sist/9056677c-b7b3-4a8d-a19c-3243c11915/iso-iec-13490-1-1995)

[Technologies de l'information — Structure de volume et de fichier de supports disque compact à lecture seule et à écriture unique pour l'échange d'information —](https://standards.iteh.ai/catalog/standards/sist/9056677c-b7b3-4a8d-a19c-3243c11915/iso-iec-13490-1-1995)

Partie 1: Généralités

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialised system for worldwide standardisation. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organisation to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organisations, 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 voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

International Standard ISO/IEC 13490 was prepared by the European Association for Standardizing Information and Communication Systems, ECMA, (as ECMA-168) 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.

ISO/IEC 13490 consists of the following parts, under the general title *Information technology – Volume and file structure of read-only and write-once compact disk media for information interchange*

- Part 1: General
- Part 2: Volume and File Structure

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Introduction

ISO/IEC 13490 can be used for both CD-ROM and CD-WO media for interchanging files. ISO/IEC 13490 is an enhancement of ISO 9660 for CD-ROM applications that has eliminated several restrictions and performance problems of ISO 9660.

ISO/IEC 13346 and ISO/IEC 13490 follow the same volume and file structure framework. ISO/IEC 13490 has common definitions with ISO/IEC 13346 regarding volume and boot block recognition, file attributes, registration procedures and record structure.

ISO/IEC 13490 is published in two parts. Part 1 - General - specifies references, definitions, notations and basic structures used in the other part. Part 2 - Volume and File Structure - specifies how to record various volume-related entities such as volumes and volume sets, and how to record and interpret files, both file data and file attributes, and file hierarchies within a volume set.

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Information technology - Volume and file structure of read-only and write-once compact disk media for information interchange -

Part 1: General

1 Scope

ISO/IEC 13490 specifies a format and associated system requirements for volume and boot block recognition, volume structure, file structure and record structure for the interchange of information between users of information processing systems using CD-WO (a write-once compact disk medium), hybrid CD-WO (a write-once compact disk with a read-only area) and CD-ROM disks.

NOTE 1 — CD-WO is an evolution of CD-ROM technology which allows the recording of information on a write-once compact disk medium.

The volume and boot block recognition is specified in ISO/IEC 13346-2. The record structure is specified in ISO/IEC 13346-5.

NOTE 2 — A volume set may be recorded that is in conformance with both ISO 9660 and ISO/IEC 13490. ISO/IEC 13490 is an enhancement of ISO 9660. ISO/IEC 13490 allows greater information interchange using CD-ROM. In addition, it supports incremental recording and updating of information stored on a CD-WO disk. Under certain restrictions (see 2/B.2.1), all of the files may be read by both a receiving system conforming to ISO 9660 and by a receiving system conforming to ISO/IEC 13490.

This part of ISO/IEC 13490 specifies references, definitions, notation and basic structures that apply to ISO/IEC 13490-2.

2 Parts references

The first digit of a reference in ISO/IEC 13490 identifies the part. If the digit is preceded by “R”, the reference is to a part and clause of ISO/IEC 13346. For example, 2/5 refers to clause 5 in ISO/IEC 13490-2 and R2/5 refers to clause 5 in ISO/IEC 13346-2. If the reference is preceded by “figure”, the reference is to a figure. For example, figure 2/5 refers to figure 5 in ISO/IEC 13490-2. If the reference is preceded by “table”, the reference is to a table. For example, table 2/5 refers to table 5 in ISO/IEC 13490-2.

3 Conformance

3.1 Conformance of a medium

A medium shall be in conformance with ISO/IEC 13490 when it conforms to a standard for recording (see 1/5.13) and all information recorded on it conforms to the specifications of ISO/IEC 13490, ISO/IEC 13346-2 and ISO/IEC 13346-5, or to ISO/IEC 13490 and ISO/IEC 13346-2. A statement of conformance shall identify the parts of ISO/IEC 13346, and the levels of medium interchange (see R2/10 and 2/16) to which the contents of the medium conform.

3.2 Conformance of an information processing system

An information processing system shall be in conformance with ISO/IEC 13490 if it meets the requirements specified in ISO/IEC 13490, ISO/IEC 13346-2 and ISO/IEC 13346-5, or in ISO/IEC 13490 and ISO/IEC 13346-2 either for an originating system (see R2/12, 2/18 and R5/11) or for a receiving system (see R2/13, 2/19 and R5/12) or for both types of system. A statement of conformance shall identify the parts of ISO/IEC 13346 and the levels of the requirements for the parts of ISO/IEC 13346 and ISO/IEC 13490 which can be met by the system.

4 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 13490. 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 13490 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/IEC 646:1991, *Information technology — ISO 7-bit coded character set for information interchange.*
- ISO/IEC 2022:1994, *Information technology — Character code structure and extension techniques.*
- ISO/IEC 6429:1992, *Information technology — Control functions for coded character sets.*
- ISO 8859-1:1987, *Information processing — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No. 1.*
- ISO 9660:1988, *Information processing — Volume and file structure of CD-ROM for information interchange.*
- ISO/IEC 9945-1:1990, *Information technology — Portable Operating System Interface (POSIX) — Part 1: System Application Program Interface (API) [C Language].*
- ISO/IEC 10149:1995, *Information technology — Data interchange on read-only 120 mm optical data disks (CD-ROM).*
- ISO/IEC 10646-1:1993, *Information technology — Universal Multiple-Octet Coded Character Set (UCS) — Part 1: Architecture and Basic Multilingual Plane.*
- ISO/IEC 13346-2:1995, *Information technology — Volume and file structure of write-once and rewritable media using non-sequential recording for information interchange — Part 2: Volume and boot block recognition.*
- ISO/IEC 13346-5:1995, *Information technology — Volume and file structure of write-once and rewritable media using non-sequential recording for information interchange — Part 5: Record structure.*
- ISO/IEC 13490-2:1995, *Information technology — Volume and file structure of read-only and write-once compact disk media for information interchange — Part 2: Volume and file structure.*
- ISO/IEC 13800^{b)}, *Information technology — Procedure for the registration of identifiers and attributes for volume and file structure.*
- IEC 908:1987, *Compact disc digital audio system.*

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5 Definitions

For the purposes of ISO/IEC 13490, the following definitions apply.

^{b)} To be published

5.1 application: A program that processes the contents of a file, and may also process selected attribute data relating to the file or to the volume(s) on which the file is recorded.

5.2 byte: A string of eight binary digits operated upon as a unit. If the standard for recording (see 1/5.13) specifies that the container for the recording of a byte has more than eight bits, a byte shall be recorded in the least significant eight bits of the container with the remaining bits of the container set to ZERO.

5.3 CD-ROM: A read-only compact disk (see 1/5.5).

5.4 CD-WO: A write-once compact disk (see 1/5.5) that conforms to a standard for recording (see 1/5.13).

5.5 compact disk: An optical disk that is recorded according to IEC 908 and ISO/IEC 10149.

5.6 descriptor: A structure containing descriptive information about a volume or a file.

5.7 file: A collection of information.

5.8 implementation: A set of processes which enable an information processing system to behave as an originating system, or as a receiving system, or as both types of system.

5.9 originating system: An information processing system which can create a set of files on a volume set for the purpose of data interchange with another system.

5.10 receiving system: An information processing system which can read a set of files from a volume set which has been created by another system for the purpose of data interchange.

5.11 record: A sequence of bytes treated as a unit of information.

5.12 sector: The data field of an addressable part of the medium that can be accessed independently of other addressable parts of the medium as specified in the standard for recording (see 1/5.13).

5.13 standard for recording: A standard that specifies the recording method and the addressing method for the information recorded on a medium. Annex A of ISO/IEC 13490-2 specifies the restrictions on a standard for recording that are relevant for ISO/IEC 13490.

The standard for recording used in conjunction with ISO/IEC 13490 is subject to agreement between the originator and recipient of the medium.

5.14 user: A person or other entity (for example, an application) that causes the invocation of the services provided by an implementation.

5.15 volume: A sector address space as specified in the standard for recording (see 1/5.13).

NOTE 3 — A medium usually has a single set of sector addresses, and is therefore a single volume. A medium may have a separate set of addresses for each side of the medium, and is therefore two volumes.

5.16 volume set: A collection of one or more volumes with identical volume set identification.

6 Notation

The following notation is used in ISO/IEC 13490.

6.1 Numerical notation

6.1.1 Decimal notation

Numbers in decimal notation are represented by decimal digits.

6.1.2 Hexadecimal notation

Numbers in hexadecimal notation are represented as a sequence of one or more hexadecimal digits prefixed by “#”:

hexadecimal digit	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
decimal value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

6.2 Bit fields

Certain fields containing an integral value, or parts of fields containing an integral value, are intended to be interpreted as an array of bits. This array of bits shall be referred to as a bit field.

Bit positions within an n bit field are numbered such that the least significant bit is numbered 0 and the most significant bit is numbered $n-1$.

6.3 Descriptor formats

Descriptor formats shall be specified by a table specifying the location, length, name and contents of each field. The interpretation of each field shall be given in the prose associated with the table.

Table 1 - Example descriptor format

Byte position	Length in bytes	Name	Contents
0	4	Data Length (=D_L)	Uint32 (1/7.1.5)
4	32	Application Identifier	regid (1/7.4)
36	4	Reserved	#00 bytes
40	2	Type	Int16 (1/7.1.4) =57
42	D_L	Implementation Use	bytes
[D_L+42]	*	Padding	#00 bytes

The descriptor specified by table 1/1 has six fields:

- The Data Length field shall be a 32-bit unsigned integer recorded according to 1/7.1.5 in byte positions 0 to 3 of the descriptor. The value of this field may be referred to as D_L.
- The Application Identifier field shall be a 32 byte field specifying an identification of an application recorded according to 1/7.4 in byte positions 4 to 35 of the descriptor.
- The Reserved field shall be 4 bytes, each with the value #00, recorded in byte positions 36 to 39 of the descriptor.
- The Type field shall be the number 57 as a 16-bit signed integer recorded according to 1/7.1.4 in byte positions 40 to 41 of the descriptor.
- The Implementation Use field shall be D_L bytes recorded in byte positions 42 to [41+D_L], where D_L is the value recorded in the Data Length field of this descriptor. A symbolic length referred to in a descriptor shall either be defined within that descriptor or be described in the interpretation of the field it is used in. The specification for the interpretation for this field might state that the interpretation of those bytes is not specified by ISO/IEC 13490, or could specify some specific interpretation for those bytes.
- The Padding field shall be a variable length field, as indicated by the asterisk "*", of bytes, each with a value of #00. The specification of the interpretation for the field shall specify the length of the field.

6.4 Character strings

A value for a sequence of bytes may be specified by a quoted sequence of characters, encoded according to the International Reference Version of ISO/IEC 646. For example, "Sheep" shall represent the bytes #53, #68, #65, #65, #70.

6.5 Arithmetic notation

The notation $ip(x)$ shall mean the integer part of x .

The notation $rem(a,b)$ shall mean $a - b \times ip(a/b)$, where a and b are integers.

6.6 Schema

The notation specified by this clause, hereafter referred to as schema, specifies the format of a structure, or sequence of structures, by construction. White space is unimportant. A structure shall be a sequence of terms. A term shall be either a name enclosed by <> or a structure definition enclosed by {}. A term may be given a name *label* by preceding the term with [*label*]. A term may be suffixed by one of the repetition operators in table 1/2.

Table 2 - Repetition operators

Operator	Interpretation
$n + m$	n to m occurrences inclusive
$n+$	n or more occurrences
n	n occurrences exactly

The expression $term1 | term2$ means either $term1$ or $term2$ shall appear at this place in the sequence.

Names shall be resolved in one of the following three ways:

- the name is that of a descriptor or term defined in ISO/IEC 13490
- the name has been defined in this structure definition using the [] notation
- the name will be defined in the prose associated with the structure definition

If a term is followed by a clause enclosed in (), it shall refer to only those objects specified by the term for which the clause is true.

These operators shall be applied in increasing order of precedence with the | operator having lowest precedence:

| repetition operator [] ()

As an example, the schema shown in figure 1/1 specifies that the term Set means zero or more Groups, where a Group is a sequence of two or more Group Headers, followed by a Group Element, which is one of three alternatives (one or two Type-1 Descriptors, or a single Type-2 Descriptor whose length is even, or one or more Type-3 Descriptors), followed by one or more Group Trailers.

```

[Set]{
    [Group]{
        <Group Header> 2+
        [Group Element]{
            <Type-1 Descriptor> 1+2
            | <Type-2 Descriptor>(descriptor length is even)
            | <Type-3 Descriptor> 1+
        }
        <Group Trailer> 1+
    } 0+
}

```

Figure 1 - Example schema

6.7 Other notations

Other notations used in ISO/IEC 13490 are specified in table 1/3.