
**Electronic imaging — Recommendations
for the expungement of information
recorded on write-once optical media**

*Imagerie électronique — Recommendations pour l'élimination des
informations enregistrées sur disque optique WORM*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The main task of Technical Committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an international standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an international standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an international standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 12037, which is a Technical Report of type 3, was prepared by Technical Committee ISO/TC 171, *Document imaging applications*, Subcommittee SC 3, *General issues*.

Annexes A and B are for information only.

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Introduction

This Technical Report describes procedures for court ordered expungement of information recorded on write-once media including the following technologies: Write-Once Read Many (WORM), Magneto-Optical Recording (MO), Compact Disk-Read Only Memory (CD-ROM), CD-ROM Recordable (CD-R) and optical tape. This report has been prepared for public offices such as courts, clerks of the court, law enforcement, social services, probation and parole, juvenile services, schools, archives, and vital records centres.

It is recognized that, unlike magnetic or magneto-optical storage media, write-once media is inherently difficult to alter. This Technical Report has been prepared to provide guidelines to ensure that uniform procedures are being followed, in order to minimize the possibility of having information recorded on write-once media rejected in a court of law. For example, a legally-ordered expungement, or expungement during file maintenance, may jeopardize the admissibility of the entire set of records as evidence in a court of law if the expungement is not documented and performed according to proper procedures.

Organizations that are subjected to expungement rulings should work with the manufacturer and manufacturer's engineering staff or supplier to obtain a satisfactory method to eliminate expunged data. Write-once media system users should address expungement prior to system implementation, in fact, as early as possible in the system design phase. Write-once optical media system users should further require vendors to demonstrate their expungement procedures and prepare a certification assuring that index data recovery and image recovery can not be performed following expungement. In addition, certification and demonstration should also be required when implementing write-once optical media system hardware or software upgrades.

Some write-once optical media systems have been implemented in such a way that makes expunging difficult or impossible. Unless the information to be expunged can be rendered uninterpretable through hardware and/or software processes, expungement can only take place by copying acceptable records (i.e., records that are not expunged) from one disk to another, destroying the first disk that contains negated record(s), and ensuring that all appropriate index entries have been updated to reflect the expungement. Update of Index entries must ensure that no side effects related to unexpunged records occur. The issue of index update is critical because, according to the rules of an expungement, once an expungement has occurred, then it must be impossible to discern that the expungement has occurred.

One method of expungement that can be used includes arranging a controlled software module that would permit wiping out a record and any computer-based indices identifying the record. It is recommended that such a software module provide a double overwrite of the selected records to lessen the possibility of the destroyed information being reconstructed. Double overwrite procedures may vary between write-once media system manufacturers and suppliers due to different implementation methods.

Electronic imaging — Recommendations for the expungement of information recorded on write-once optical media

1 Scope

This Technical Report applies to the removal of information recorded on write-once optical media systems when expungement is ordered by the court or administrative authority. Expungement requires specific removal actions to occur.

This report establishes procedures for both information removal and documentation of the actions taken during removal. Following the recommendations contained in this Technical Report will ensure that the expungements are performed consistently.

2 Reference

ISO/TR 12654:1997, *Electronic imaging — Recommendations for the management of electronic recording systems for the recording of documents that may be required as evidence, on WORM optical disk.*

3 Terms and definitions

For the purpose of this Technical Report the following definitions apply.

3.1

amendment

correction or revision

3.2

bit-map

method of representing images by assigning an individual memory location for each picture element

3.3

capture

recording of data in a form for its entry into a computer system

3.4

compact disk — read only memory CD-ROM (abbreviation)

optical disk containing prerecorded data and used only for reading

3.5

compact disk — write-once-read-many CD-WORM (abbreviation)

optical disk that is user written and then is only available for reading

3.6**compact disk recordable
CD-R (abbreviation)**

optical disk conforming to the specification of a compact disk, which can be written to only once (or in multi-session disks only once per session) by a user write system

3.8**document**

any writing, drawing, photograph or other instrument used for the communication of information

NOTE A document may consist of a single page or multiple pages.

3.9**expungement**

process of removing a document from a system and leaving no evidence of the document ever having appeared on the system

3.10**file, noun**

collection of records

3.11**image**

pictorial representation of a document page, whether stored in coded or bit-mapped form (also see 3.20 below)

3.12**index**

systematic guide that allows access to specific items contained within a body of information

NOTE Indexes may or may not be resident on the write-once optical media, depending upon specifics of an implementation. Indexes for records may exist in manual and/or automated formats.

3.13**information**

data that has been analyzed, interpreted, or compiled in a meaningful form

3.14**magneto optic recording**

technique for recording data on a rewritable medium using optical means to change the polarity of a magnetic field in the recording medium

3.15**media**

materials used to store or present information and data

3.16**multi-function drive system**

optical disk drive which can use both write-once-read-many and rewritable optical media

3.17**obliteration**

within the context of expungement, rendering a record uninterpretable

3.18**optical disk**

disk that will accept and retain information in the form of marks in a recording layer that can be read with an optical beam

3.19**optical tape**

optical memory in tape form

3.20 **page**

3.20.1

Page (Document management)

graphic and/or text presented on one side of a piece of paper

3.20.2

Page (Electronic data)

information stored between page breaks whether electronically generated or digitized from hard copy

3.20.3

Page (visual display unit)

information displayed on the screen which may or may not correspond to a physical page

3.21

record

recorded information, regardless of media or characteristics, made or received and maintained by an organization or institution in pursuance of its legal obligations or in the transaction of business

3.22

rewritable optical disk

optical media that can be written, erased, and rewritten

3.23

write-once-read-many optical disk

WORM (abbreviation) optical disk

optical disks on which each logical sector can be written only once but read many times

3.24

write-once-read-many system

information system that uses write-once optical media for data storage

4 File integrity recommendations

While expunging information, it is essential to ensure the accuracy, completeness, and legal acceptance of both the expungement and the remaining information stored with write-once optical media technology. As expungement must be certified in an official record, the integrity of a file can be best demonstrated by following routine operating procedures and establishing an audit trail (see ISO/TR 12654). The audit trail for expungement is created by documenting expungement procedures and by preparing documentation describing the purpose and scope for each expungement.

4.1 Capture of the Court Order and Change Notice

In those instances where the court order contains information which could identify the expunged document, or could reveal the original information, the order should not be captured and recorded on the write-once media. Only the Change Notice (see Annex A) should be recorded. The Change Notice should include an appropriate reference to the court order.

4.2 Physically eliminating the image

Expungement may require the information on write-once media to be eliminated, leaving no evidence of the original information. The procedure for physically eliminating page(s) or record(s) will differ depending on the equipment utilized by an organization. The process of elimination requires rendering uninterpretable the original image(s) of the record(s), typically by overwriting with a revised image(s).

Index correction procedures should be demonstrated by the equipment manufacturer or supplier. Indexes stored on non-electronic media (paper and film) must also be corrected. This technical report does not address procedures for non-digital (analogue) index correction.

4.3 Rewriting the disk

Expungement may require the rewriting of all indexes, pages, or documents other than the expunged record(s) to an entirely new write-once media. This procedure is referred to as consolidation. Using this procedure, the old media and any associated indexes on the media must be physically destroyed, with index correction occurring for indexes stored in magnetic or analogue format.

4.4 Documentation

Documentation of the write-once media expungement process consists of a court order mandating the change and the completed change notice. Both the court order and the change notice, if applicable, should be written to the same write-once media as the original record(s).

5 Index

Where a complete page or record is expunged, remove all reference(s) to the page or record from the indexes. If the index(es) has been copied, recopy the index after the reference(s) to the page or record has been removed.

6 Copies

Copies of the original write-once media and copies of the information removed by expungement should be destroyed or obliterated to comply with the court order. No record, index, or reference to the original unrevised information should exist on write-once media copies or copies in any other media, whether paper, magnetic, film, or digital optical.

Annex A (informative)

Change notice

Information has been expunged from this write-once media according to Court Order

(Court Order Number and Court Jurisdiction),

or by the order of the following official

(name, title and office),

(signature).

This information was removed and destroyed by

(signature of the person carrying out the expungement)

on (Date.)

(title)

(organization)

(and address)

Write-once media indexes and write-once media copies and copies in any other media, whether paper, magnetic, film, or optically based were rendered uninterpretable by

(signature of the person carrying out the expungement)

on (Date.)

(title)

(organization)

(and address)

Describe the expunged information. (Do not reveal information protected by Court Order).

(Do not reveal information protected by Court Order)