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**Information technology — Digitally  
recorded media for information  
interchange and storage — Test method  
for the estimation of the archival lifetime  
of optical media**

*Technologies de l'information — Supports enregistrés numériquement  
pour l'échange et le stockage d'information — Méthode d'essai pour  
l'estimation de la durée de vie d'archivage des supports optiques*



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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 10995 was prepared by Ecma International (as ECMA-379) 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.

This second edition cancels and replaces the first edition (ISO/IEC 10995:2008), which has been technically revised.

## Introduction

Markets and industry have developed the common understanding that the property referred to as the archival life of data recorded to optical media plays an increasingly important role for the intended applications. The existing standard test methodologies for recordable media include Magneto Optical media and recordable compact disk systems. It was agreed that the project represented by this document be undertaken in order to provide a methodology that includes the testing of newer, currently available products.

The Optical Storage Technology Association (OSTA) initiated work on this subject and developed the initial drafts. Following that development, the project was moved to Ecma International Technical Committee TC 31 for further development and finalization. OSTA and Ecma wish to thank the members and organizations in NIST, CDs21 Solutions, and DCAj for their support of the development of this document.

ECMA-379 1<sup>st</sup> Edition was fast-tracked to ISO/IEC JTC 1 in August 2007 and during this process its editorial content was slightly modified. The approved International Standard was published as ISO/IEC 10995:2008 in April 2008. ECMA-379 2<sup>nd</sup> Edition is technically identical with ISO/IEC 10995:2008. ECMA-379 3<sup>rd</sup> Edition is an editorial amendment including corrections of some calculations, and the Bootstrap method has been deleted. Although the Bootstrap method poses no problem in itself, miscalculation might be caused depending on the data set conditions.

# Information technology — Digitally recorded media for information interchange and storage — Test method for the estimation of the archival lifetime of optical media

## 1 Scope

This International Standard specifies an accelerated aging test method for estimating the life expectancy for the retrievability of information stored on recordable or rewritable optical disks.

This test includes details on the following formats: DVD-R/-RW/-RAM, +R/+RW. It can be applied to additional optical disk formats with the appropriate specification substitutions and can be updated in the future as required.

This International Standard includes

- stress conditions,
- assumptions,
- ambient conditions,
  - controlled storage conditions, e.g. 25 °C and 50 % RH, using the Eyring model,
  - uncontrolled storage conditions, e.g. 30 °C and 80 % RH, using the Arrhenius model,
- evaluation system description,
- specimen preparation,
- data acquisition procedure, and
- data interpretation.

The methodology includes only the effects of temperature (T) and relative humidity (RH). It does not attempt to model degradation due to complex failure mechanism kinetics, nor does it test for exposure to light, corrosive gases, contaminants, handling, and variations in playback subsystems. Disks exposed to these additional sources of stress or higher levels of T and RH are expected to experience shorter usable lifetimes.

## 2 Conformance

Media tested by this methodology shall conform to all normative references specific to that media format.

### 3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 12862:2009, *Information technology — 120 mm (8,54 Gbytes per side) and 80 mm (2,66 Gbytes per side) DVD recordable disk for dual layer (DVD-R for DL)* (ECMA-382)

ISO/IEC 13170:2009, *Information technology — 120 mm (8,54 Gbytes per side) and 80 mm (2,66 Gbytes per side) DVD re-recordable disk for dual layer (DVD-RW for DL)* (ECMA-384)

ISO/IEC 16448:2002, *Information technology — 120 mm DVD — Read-only disk* (ECMA-267)

ISO/IEC 16449:2002, *Information technology — 80 mm DVD — Read-only disk* (ECMA-268)

ISO/IEC 17341:2009, *Information technology — Data interchange on 120 mm and 80 mm optical disk using +RW format — Capacity: 4,7 Gbytes and 1,46 Gbytes per side (recording speed up to 4X)* (ECMA-337)

ISO/IEC 17342:2004, *Information technology — 80 mm (1,46 Gbytes per side) and 120 mm (4,70 Gbytes per side) DVD re-recordable disk (DVD-RW)* (ECMA-338)

ISO/IEC 17344:2009, *Information technology — Data interchange on 120 mm and 80 mm optical disk using +R format — Capacity: 4,7 Gbytes and 1,46 Gbytes per side (recording speed up to 16X)* (ECMA-349)

ISO/IEC 17592:2004, *Information technology — 120 mm (4,7 Gbytes per side) and 80 mm (1,46 Gbytes per side) DVD rewritable disk (DVD-RAM)* (ECMA-330)

ISO/IEC 23912:2005, *Information technology — 80 mm (1,46 Gbytes per side) and 120 mm (4,70 Gbytes per side) DVD Recordable Disk (DVD-R)* (ECMA-359)

ISO/IEC 25434:2008, *Information technology — Data interchange on 120 mm and 80 mm optical disk using +R DL format — Capacity: 8,55 Gbytes and 2,66 Gbytes per side (recording speed up to 16X)* (ECMA-364)

ISO/IEC 26925:2009, *Information technology — Data interchange on 120 mm and 80 mm optical disk using +RW HS format — Capacity: 4,7 Gbytes and 1,46 Gbytes per side (recording speed 8X)* (ECMA-371)

ISO/IEC 29642:2009, *Information technology — Data interchange on 120 mm and 80 mm optical disk using +RW DL format — Capacity: 8,55 Gbytes and 2,66 Gbytes per side (recording speed 2,4X)* (ECMA-374)