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Imaging materials — Optical disc media — Storage practices

*Matériaux pour l'image — Milieux pour disque optique —
Pratiques de stockage*



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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.

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

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member 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 shall not be held responsible for identifying any or all such patent rights.

ISO 18925 was prepared by Technical Committee ISO/TC 42, *Photography*.

This third edition cancels and replaces the second edition (ISO 18925:2008), of which it constitutes a minor revision.

The following change has been made to the second edition:

- an update of the bibliographical references.

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Introduction

Use of optical disc material is becoming widespread in audio, video, and computer applications. Preservation of this information is becoming of increasing concern to society, particularly as the recorded information becomes older and frequently of greater value to libraries, archives, museums, government agencies, and commercial organizations.

The stability of optical discs is dependent upon that of the complete system. This includes the stability of the material itself, the equipment on which it is run and, in systems, upon the necessary software. ISO 18921 specifies a methodology for estimating the life expectancy of the CD-ROM. Other optical discs will be addressed in future International Standards. These standards consider only the effects of temperature and humidity and do not include other factors such as light, corrosive gases, and particulates. International Standards are not available on the life expectancy of hardware and the problems associated with hardware wearing out or becoming obsolete.

It is advisable that optical disc users store discs under conditions that will extend their life and handle the material so that it will not be subjected to stress and undergo physical breakdown during use. This International Standard addresses the concerns of long-term storage.

A major component of a large number of optical discs is the polycarbonate substrate. Polycarbonate is a very durable material, but it does absorb moisture and there is always an equilibrium between the ambient humidity and the moisture content of the disc. Polycarbonate is susceptible to decomposition under certain conditions and given a suitable catalyst.

The second component of most optical discs is the reflective layer. This layer is usually some highly reflective metal such as aluminium, silver, or gold. Each of these materials is subject to reaction with various chemicals that can be found in the environment. Aluminium, for example, combines readily with oxygen to form aluminium oxide. Silver combines with sulfur to tarnish and form silver sulfides. Gold is known to react with chlorine to form gold chlorides.

A third component of these discs is some type of seal coat. This is typically a UV-cured polymer whose purpose is to protect the reflective layer and any other material layers in the disc.

A fourth component, in the case of some recordable optical discs, is the dye layer. For magneto-optic or phase change discs, additional layers are also included.

Regardless of the inherent stability of the various disc layers, it is known that good storage conditions will extend the life of all optical discs. While a good storage environment cannot reverse any degradation that has already occurred, it can slow down additional deterioration.

A single storage condition is described in this International Standard. This condition is intended for discs that contain recorded information of long-term value. Various manufacturers' studies indicate that the life expectancy of well-manufactured optical discs is in excess of 50 years under typical room ambient conditions (see References [1] and [2]).