

This is a preview of "ISO 18938:2014". [Click here to purchase the full version from the ANSI store.](#)

Second edition
2014-09-15

Imaging materials — Optical discs — Care and handling for extended storage

*Matériaux pour l'image — Disques optiques — Précautions et
manipulation pour stockage étendu*



Reference number
ISO 18938:2014(E)

© ISO 2014

This is a preview of "ISO 18938:2014". [Click here to purchase the full version from the ANSI store.](#)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2014

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

This is a preview of "ISO 18938:2014". [Click here to purchase the full version from the ANSI store.](#)

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	2
3 Terms and definitions	2
4 Composition of optical discs	6
4.1 General.....	6
4.2 Polycarbonate substrate (plastic) layer.....	6
4.3 Data layer.....	6
4.4 Reflective layer.....	7
4.5 Protective layers.....	7
4.6 Adhesive layers.....	7
4.7 Additional layers.....	8
5 Failure mechanisms	8
5.1 General.....	8
5.2 Physical stress.....	8
5.3 Layer sensitivity.....	8
5.4 Scratches.....	9
5.5 Effects of disc play.....	9
6 Handling techniques	10
6.1 General.....	10
6.2 Flexing.....	10
6.3 Contamination.....	10
6.4 Disc enclosures.....	10
7 Identification	11
7.1 Basic concepts.....	11
7.2 Adhesive labels.....	11
7.3 Printing on optical discs.....	11
7.4 Thermal printing.....	12
7.5 Inkjet printable surface.....	12
7.6 Silk screening.....	12
7.7 Marking.....	12
8 Contamination	12
8.1 Fingerprints, smudges, dirt, dust.....	12
8.2 Moisture.....	12
8.3 Organic solvents.....	13
8.4 Gaseous impurities.....	13
8.5 Consumables.....	13
9 Use environment	13
9.1 General.....	13
9.2 Temperature and humidity.....	13
9.3 Water avoidance.....	14
9.4 Air quality.....	14
9.5 Light exposure.....	14
9.6 Acclimatization.....	15
9.7 Vibrations.....	15
10 Transportation and shipping	15
10.1 Enclosures.....	15
10.2 Cartons.....	15
10.3 Exposure.....	16

This is a preview of "ISO 18938:2014". [Click here to purchase the full version from the ANSI store.](#)

10.4	Security.....	16
10.5	External fields.....	16
10.6	Biological irradiation.....	16
11	Inspection.....	16
11.1	General requirements.....	16
11.2	Error rate monitoring.....	17
12	Cleaning and maintenance.....	17
12.1	General.....	17
12.2	Solvents and cleaning compounds.....	17
12.3	Cleaning methods.....	17
13	Disasters.....	18
13.1	General.....	18
13.2	Water.....	18
13.3	Fire.....	18
13.4	Dry debris.....	18
13.5	Impact from disasters.....	19
13.6	Repair.....	19
14	Disaster response.....	19
14.1	General.....	19
14.2	Wet discs.....	19
14.3	Dry discs.....	19
15	Staff training.....	19
15.1	General.....	19
15.2	Purpose.....	20
15.3	Training paths.....	20
15.4	Schedule for training.....	20
15.5	Update of training.....	20
15.6	Content of training.....	20
16	Minimum handling requirements checklist.....	21
16.1	General.....	21
16.2	Do list.....	21
16.3	Not-to-do list.....	21
Annex A (informative) Disc structure.....		23
Bibliography.....		25

This is a preview of "ISO 18938:2014". [Click here to purchase the full version from the ANSI store.](#)

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 procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 42, *Photography*.

This second edition cancels and replaces the first edition (ISO 18938:2008), which has been technically revised.

Introduction

In addition to storage conditions, the proper care and handling of optical discs is also vital to prolonged disc life. This is becoming increasingly important as optical discs are widely used for the recording and storage of information. This International Standard gives guidelines for their recommended care and handling and will be beneficial for all digital optical discs, regardless of their inherent stability.

NOTE It is recognized that both "optical discs" and "optical disks" are acceptable spellings. In this International Standard, the former spelling is used.

Probably no form of data storage has been accepted and adopted as rapidly as the optical disc. It has become the medium of choice for numerous applications with ever increasing use for the recording and storage of information. Information is recorded in digital format that not only provides high storage density, but also allows duplication without information loss, ease of data manipulation and facilitates transmission. It is of tremendous benefit for audio usage since it permits uninterrupted playback for long periods of time. Information in a disc format can be accessed very quickly, unlike that in a roll format such as magnetic tape, which requires longer search time.

While the advantages are many, as with other media, there are nevertheless concerns about the life expectancy of recorded information on optical discs. This depends upon three independent components, namely the permanence of the disc itself, the disc drive and the software. Obsolescence of the disc drive and software, lack of playback device or inoperability of the playback device are all serious uncertainties. Another important issue is the quality of the initial data recorded onto the disc, which needs to be as high as possible. In addition, the very popularity of recordable optical discs has led to their wide availability, and wide variability in the quality of discs for long term preservation of information. Many discs may not be of sufficient quality for long term use.

The finite life of optical discs is well recognized and one approach to addressing this issue is by periodically transferring or reformatting the information. In addition, the ability to play back a disc in the future depends on the existence of functional playback equipment. As newer formats and equipment become popular, equipment manufacturers will probably discontinue production and support of the older, superseded equipment. Eventually, usable equipment to play obsolete optical disc formats will become difficult to find. Before this occurs, it is advisable that a migration plan be in place. However, these issues are outside the scope of this International Standard, which is only concerned with the stability of the optical disc itself. A primary objective of those involved with the preservation of information on this media is to ensure that the disc is not the weak link among the necessary components. To support this objective, it is advisable that steps be taken to maximize the optical disc's potential to be more stable than either the hardware or the software.

As with paper records, photographic film and magnetic tape, optical discs are subject to both damage and decay. They have a finite life. Predictions of the life expectancy of optical discs have involved extrapolations of property retention after high temperature and humidity incubations back to practical conditions. These extrapolations follow mathematical treatments that were developed for simpler chemical reactions, and therefore the results need to be interpreted with some caution. Predictions cover a very wide range, from 25 years to over 250 years, which vary with the manufacturer and the disc type. Their effective life can be increased or decreased significantly depending upon the conditions under which they are stored. Storage recommendations for optical discs are given in ISO 18925. Following these recommendations promotes the physical integrity of the media and increases their effective life.