

© Copyright SEK. Reproduction in any form without permission is prohibited.

## System för ljudarkiv – Del 1-1: DVD-skivor och datamigrering för långtidslagring

*Audio archive system –*

*Part 1-1: DVD disk and data migration for long term audio data storage*

Som svensk standard gäller europastandarden EN 62702-1-1:2016. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62702-1-1:2016.

### Nationellt förord

Europastandarden EN 62702-1-1:2016

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 62702-1-1, First edition, 2016 - Audio archive system - Part 1-1: DVD disk and data migration for long term audio data storage**

utarbetad inom International Electrotechnical Commission, IEC.

---

ICS 33.160.30; 35.220.30

---

Denna standard är fastställd av SEK Svensk Elstandard, som också kan lämna upplysningar om **sakinnehållet** i standarden.  
Postadress: Box 1284, 164 29 KISTA  
Telefon: 08 - 444 14 00.  
E-post: sek@elstandard.se. Internet: www.elstandard.se

---

### *Standarder underlättar utvecklingen och höjer elsäkerheten*

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

### *SEK är Sveriges röst i standardiseringsarbetet inom elområdet*

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

### *Stora delar av arbetet sker internationellt*

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

### *Var med och påverka!*

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

### **SEK Svensk Elstandard**

Box 1284  
164 29 Kista  
Tel 08-444 14 00  
[www.elstandard.se](http://www.elstandard.se)

---

ICS 33.160.30; 35.220.30

English Version

**Audio Archive System - Part 1-1: DVD disk and data migration  
for long term audio data storage  
(IEC 62702-1-1:2016)**

Système d'archivage audio - Partie 1-1: Disque DVD et  
migration de données pour le stockage à long terme des  
données audio  
(IEC 62702-1-1:2016)

Audio Archivierungssystem - Teil 1-1: DVD Disk und  
Datenmigration für die Langzeit Audiodaten Speicherung  
(IEC 62702-1-1:2016)

This European Standard was approved by CENELEC on 2016-06-16. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## **European foreword**

The text of document 100/2449/CDV, future edition 1 of IEC 62702-1-1, prepared by Technical Area 6 “Storage media, storage data structures, storage systems and equipment” of IEC/TC 100 “Audio, video and multimedia systems and equipment” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62702-1-1:2016.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-03-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-06-16

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

## **Endorsement notice**

The text of the International Standard IEC 62702-1-1:2016 was approved by CENELEC as a European Standard without any modification.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO/IEC 16448	2002	Information technology - 120 mm DVD - Read-only disk	-	-
ISO/IEC 16963	-	Information technology - Digitally recorded - media for information interchange and storage - Test method for the estimation of lifetime of optical disks for long-term data storage	-	-
ISO/IEC 29121	-	Information technology - Digitally recorded - media for information interchange and storage - Data migration method for DVD-R, DVD-RW, DVD-RAM, +R, and +RW disks	-	-

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions .....	7
4 Disk and lifetime for long term audio data storage .....	9
4.1 Disk for long term audio data storage .....	9
4.2 Lifetime estimation .....	9
4.3 $B_{\text{mig}}$ Life for long-term audio data storage.....	9
4.4 Estimated-lifetime rank and display colour .....	10
4.4.1 Estimated-lifetime rank and display colour identification .....	10
4.4.2 $B_{\text{mig}}$ Life and display colour indication on disks and packages .....	10
5 Test condition, test methods and disks for audio data migration.....	10
5.1 Ambient conditions for testing.....	10
5.2 Test methods .....	11
5.2.1 Playback test drive.....	11
5.2.2 Test area of recorded disk.....	11
5.2.3 Recording test drive .....	11
5.3 Test drive calibration .....	11
6 Test result evaluation .....	11
6.1 Initial performance test result evaluation .....	11
6.2 Periodic performance test evaluation .....	12
6.3 Reporting items.....	13
6.3.1 Initial performance test result .....	13
6.3.2 Periodic performance test result .....	13
6.4 Management of reporting item .....	13
6.5 Test and migration intervals .....	13
7 Prevention of deterioration.....	14
Annex A (informative) Guideline of usage and indication.....	15
A.1 Usage of lifetime rank .....	15
A.2 Lifetime rank indication and place.....	15
A.2.1 Lifetime rank indication .....	15
A.2.2 Indication example .....	15
Annex B (informative) Recommendations on handling, storage and cleaning conditions for DVD-R, DVD-RW, DVD-RAM, +R, and +RW disks .....	16
B.1 Handling .....	16
B.2 Storage.....	16
B.3 Cleaning .....	17
Annex C (informative) Guideline of disk history record .....	18
Bibliography .....	24
Figure 1 – Data migration flow for DVD-R, DVD-RW, DVD-RAM, +R, and +RW disks.....	13
Figure A.1 – Indication example .....	15

Table 1 – Category of initial recording performance .....	12
Table 2 – Category of recording performance at periodic performance test.....	12
Table B.1 – Recommended conditions for general storage .....	16
Table B.2 – Recommended conditions for Controlled storage.....	16
Table C.1 – Sectors of the disk history file.....	19
Table C.2 – Byte content of sector 0 ~7 of the disk history file .....	20
Table C.3 – Byte format of sector 8 to 15 and 9 to the following of the disk history file.....	22

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## AUDIO ARCHIVE SYSTEM –

## Part 1-1: DVD disk and data migration for long term audio data storage

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62702-1-1 has been prepared by technical area 6: Storage media, storage data structures, storage systems and equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard is based on the following documents:

CDV	Report on voting
100/2449/CDV	100/2518/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

Sound recordings such as music, speech, and storytelling are an important human heritage and should be preserved for as long as possible. However, we were not able to record sounds in order to preserve them in the past. The first recoding was achieved by Edison in 1877.

Although various technologies were invented later, most of them have limitations for audio archives because storage life time is limited and the sound quality deteriorates when it is transferred to the next generation storage device.

The progress of LSI technology made digital recording of recorded sound possible. The digital recording is very suitable for audio archiving because the migration is performed by copying digital data.

For this purpose various recording materials exist, such as optical disks, magnetic disks, magnetic tape and nonvolatile memory such as a phase change memory.

This International Standard specifies physical and logical aspects for a standard of audio archives of various storage types which are typically used for audio archives in markets.

The IEC 62702 series currently consists of:

Part 1 specifies the minimum requirements on physical aspects of optical disks for digital sound recordings. Part 1-1 specifies DVD optical disks, and Part 1-2 specifies BD optical disks.

Part 2 specifies the minimum requirements for digitization of content, format of digitised content, content information and media inspection.

## AUDIO ARCHIVE SYSTEM –

### Part 1-1: DVD disk and data migration for long term audio data storage

#### 1 Scope

This part of IEC 62702 specifies a method of data-quality assurance for writable DVD disks (hereinafter disks) which are specified for long term data storage, and a data migration method which can sustain the recorded data on disks for long term audio data preservation. The writable disks include recordable disks such as DVD-R, and +R format, and rewritable disks such as DVD-RW, +RW format and DVD-RAM.

#### 2 Normative references

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

ISO/IEC 16448:2002, *Information technology – 120 mm DVD – Read-only disk*

ISO/IEC 16963, *Information technology – Digitally recorded media for information interchange and storage – Test method for the estimation of lifetime of optical media for long-term data storage*

ISO/IEC 29121:2013, *Information technology – Digitally recorded media for information interchange and storage – Data migration method for DVD-R, DVD-RW, DVD-RM, +R, and +RW disks*