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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH DENSITY RECORDING FORMAT ON CD-R/RW DISC SYSTEMS – HD-BURN FORMAT

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International Standard IEC 62403 has been prepared by technical area 7: Moderate data rate storage media, equipment and systems of IEC technical committee TC 100: Audio, video and multimedia systems and equipment.
The text of this standard is based on the following documents:

<table>
<thead>
<tr>
<th>CDV</th>
<th>Report on voting</th>
</tr>
</thead>
<tbody>
<tr>
<td>100/844/CDV</td>
<td>100/926/RVC</td>
</tr>
</tbody>
</table>

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 maintenance result 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- withdrawn;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.

A bilingual version of this publication may be issued at a later date.
1 Scope

This International Standard specifies the HD-BURN format applied to CD-R/RW discs. The HD-BURN system is capable of recording the information in double density compared to the conventional CD-R/RW disc. It enables the realization of products with high reliability, high speed and interchangeability, and is especially suitable for consumer applications with high cost-performance.

This document describes:
- the physical characteristics for the recording and playback;
- the track structure of a disc;
- the data structure in the track;
- logical format structure.

2 Normative references

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

IEC 60908, Audio recording – Compact disc digital audio system

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

ISO/IEC 20563, Information technology – 80 mm (1.23 Gbytes per side) and 120 mm (3.95 Gbytes per side) DVD-recordable disc (DVD-R)

IEC 62291:2002, Multimedia data storage – Application program interface for UDF based file systems

ISO 9660:1988, Volume and file structure of CD-ROM for Information Interchange


The Red Book: Compact disk digital Audio System Description Version, May 1999 Sony/Philips

The Orange Book part2: Recordable compact disk systems, Part2 CD-R Version 3.1, Sony/Philips

The Orange Book part 3: Recordable compact disk system, Part3 CD-RW Volume 3, Ultra-Speed Ver 1.0

NOTE The Red book and Orange book can be obtained from Sony/Philips.
3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 absolute time in pre-groove
ATIP
time-code information contained in the pre-groove with an additional modulation of the wobble

3.2 access guard area
AGA
preamble data area for reading the following ECC blocks

3.3 HD-BURN
high-density write system at CD-R/RW disc

3.4 land pre pit
LPP
pits embossed on the land during the manufacture of the disc substrate, which contain address information

3.5 multi-session
disc constituted by some sessions

3.6 non CD sector
sector, which has a different structure from the CD

3.7 physical sector number
PSN
serial number, which is allocated to physical sectors on the disc

3.8 pre-groove
guidance track in which clocking and time code information is stored by means of an FM modulated wobble

3.9 program memory data
PMD
information, which is described on the recording program of the disc, including information on each recording mode

3.10 program start information
PSI
start address of the first lead-in
3.11 Reed-Solomon product code
RSPC
method of an error correction code, which corrects errors by multiple bits

3.12 sector
smallest addressable part of a track in the information zone of a disc that can be accessed independently of other addressable parts

3.13 session
area on the disc consisting of lead-in area, program area and lead-out area

3.14 synchronization frame
group of 1488 channel bits, which is representing a synchronization pattern

3.15 temporary program memory area
TPMA
area, which is used for intermediate storage

3.16 track
path, which is followed by the focus of the optical beam during one revolution of the disc

4 Convention and notations

4.1 Representation of numbers
A measured value is rounded off to the least significant digit of the corresponding specified value. It implies that a specified value of 1.26 with a positive tolerance of +0.01, and a negative tolerance of –0.02 allows a range of measured values from 1.235 to 1.275.

- Letters and digits in parentheses represent numbers in hexadecimal notation.
- The setting of a bit is denoted by ZERO or ONE.
- Numbers in binary notation and bit combinations are represented by strings of 0 and 1.
- Numbers in binary notation and bit combinations are shown with the most significant bit to the left.
- Negative values of numbers in binary notation are given in Two's complement.
- In each field the data is recorded so that the most significant byte (byte 0) is recorded first. Within each byte the least significant bit is numbered 0 and is recorded first, the most significant bit (numbered 7 in an 8-bit byte) is recorded last. This order of recording applies also to the data input of the error detection and correction circuits and to their output.
4.2 Names
The names of entities, for example specific tracks, fields, etc., are given with a capital letter.

5 List of acronyms

ADB Address Data Bit
ALPC Auto Laser Power Control
ASYM Asymmetry
BCD Binary Coded Decimal
BP Byte Position
BPF Band Pass Filter
CD-R Compact Disk Recordable
CD-RW Compact Disk ReWritable
CDS Codeword Digital Sum
CD-WO Compact Disk Write Once
CLV Constant Linear Velocity
CRC Cyclic Redundancy Check
DCB Data Channel Bit
DSV Digital Sum Value
DVD Digital Versatile Disc
ECC Error Correction Code
EDC Error Detection Code
HDB High Density Burn ( = HD-BURN)
HF High Frequency
ID Identification Data
IED ID Error Detection code
LOS Lead-out Start Address
LPF Low-Pass Filter
LSB Least Significant Byte
MSB Most Significant Byte
NRZI Non Return to Zero Inverted
OPC Optimum Power Control
PAD Padding
PCA Power Calibration Area
PI Parity of Inner-code
PMA Program Memory Area
PO Parity of Outer-code
PUH Pick Up Head
R/W Rewritable
RID Recorder Identifier
RS Reed-Solomon