INTERNATIONAL STANDARD

ISO/IEC 30191

Third edition
2021-01

Information technology — Digitally recorded media for information interchange and storage — 120 mm Triple Layer (100,0 Gbytes single sided disk and 200,0 Gbytes double sided disk) and Quadruple Layer (128,0 Gbytes single sided disk) BD Recordable disk

Technologies de l'information — Supports enregistrés numériquement pour échange et stockage d'information — 120 mm de couche triple (100,0 Go disque unique face et 200,0 Go disque double face) et quadruple couche (128,0 Go disque unique face) sur disque enregistrable BD



Reference number
ISO/IEC 30191:2021(E)

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Published in Switzerland

Contents

Page

Foreword ..... **xi**
Introduction ..... **xii**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **2**
4 Symbol and abbreviated terms **2**
5 Conformance **3**
5.1 Optical disk 3
5.2 Generating system 4
5.3 Receiving system 4
5.4 Compatibility statement 4
6 Convention and notations **4**
6.1 Levels of grouping 4
6.2 Representation of numbers 4
6.3 Integer calculus 6
7 General description of disk **6**
8 General requirements **8**
8.1 Environments 8
8.1.1 Test environment 8
8.1.2 Operating environment 8
8.1.3 Storage environment 9
8.1.4 Transportation 10
8.2 Safety requirements 10
8.3 Flammability 11
9 Reference drive **11**
9.1 General 11
9.2 Measurement conditions 11
9.3 Optical system 11
9.4 Optical beam 12
9.5 HF read channel 13
9.6 Radial PP read channel 14
9.7 Disk clamping 14
9.8 Rotation of disk and measurement velocity 14
9.9 Normalized servo transfer function 15
9.10 Measurement velocities and reference servos for axial tracking 15
9.10.1 General 15
9.10.2 Reference servo for axial tracking at 1x measurement velocity 16
9.10.3 Reference servo for axial tracking at 2x measurement velocity 17
9.11 Measurement velocities and reference servos for radial tracking 18
9.11.1 General 18
9.11.2 Reference servo for radial tracking at 1x measurement velocity 18
9.11.3 Reference servo for radial tracking at 2x measurement velocity 20
10 Dimensional characteristics **21**
10.1 General 21
10.2 Disk reference planes and reference axis 22
10.3 Overall dimensions 23
10.4 First transition area 23
10.5 Protection ring 24
10.6 Clamping zone 24
10.7 Second transition area 24

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10.8 Information area ... 24
10.8.1 General ... 24
10.8.2 Subdivision of information zone on TL disk ... 25
10.8.3 Subdivision of information zone on QL disk ... 26
10.9 Rim area ... 28

11 Mechanical characteristics ... 28
11.1 Mass ... 28
11.2 Moment of inertia ... 28
11.3 Dynamic imbalance ... 28
11.4 Axial runout ... 29
11.4.1 General ... 29
11.4.2 Residual axial tracking error for 1x measurement velocity ... 29
11.4.3 Residual axial tracking error for 2x measurement velocity ... 29
11.5 Radial runout ... 30
11.5.1 General ... 30
11.5.2 Residual radial tracking error on 1x measurement velocity ... 30
11.5.3 Residual radial tracking error on 2x measurement velocity ... 30
11.6 Durability of cover layer ... 31
11.6.1 Impact resistance of cover layer ... 31
11.6.2 Scratch resistance of cover layer ... 31
11.6.3 Repulsion of fingerprints by cover layer ... 31

12 Optical characteristics in information area ... 31
12.1 General ... 31
12.2 Refractive index of the transmission stacks (TS) ... 31
12.3 Thickness of transmission stacks (TS) ... 31
12.3.1 Thickness of transmission stack of TL disks ... 31
12.3.2 Example of target thickness of spacer layers for TL disks ... 32
12.3.3 Thickness of transmission stacks of QL disks ... 33
12.3.4 Example of target thickness of spacer layers for QL disks ... 34
12.4 Reflectivity of recording layers ... 36
12.5 Birefringence ... 37
12.6 Angular deviations ... 37

13 Data format ... 38
13.1 General ... 38
13.2 Data frame ... 40
13.3 Error detection code (EDC) ... 40
13.4 Scrambled data frame ... 41
13.5 Data block ... 41
13.6 LDC block ... 42
13.7 LDC code words ... 43
13.8 LDC cluster ... 44
13.8.1 General ... 44
13.8.2 First interleaving step ... 44
13.8.3 Second interleaving step ... 44
13.9 Addressing and control data ... 46
13.9.1 General ... 46
13.9.2 Address units ... 46
13.9.3 User control data ... 51
13.9.4 Byte/bit assignments for user control data ... 51
13.10 Access block ... 53
13.11 BIS block ... 53
13.12 BIS code words ... 54
13.13 BIS cluster ... 55
13.14 ECC cluster ... 58
13.15 Recording frames ... 59
13.16 Physical cluster ... 60
13.17 17PP modulation for recordable data ... 60

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13.17.1 General ... 60
13.17.2 Bit conversion rules ... 60
13.17.3 dc-control procedure ... 61
13.17.4 Frame sync ... 61
13.18 Modulation and NRZI conversion ... 63

14 Physical data allocation and linking ... 63
14.1 General ... 63
14.2 Recording unit block (RUB) ... 64
14.2.1 General ... 64
14.2.2 Data run-in ... 64
14.2.3 Data run-out ... 65
14.2.4 Guard_3 field ... 66
14.3 Locating data relative to wobble addresses ... 67

15 Track format ... 67
15.1 General ... 67
15.2 Track shape ... 67
15.3 Track path ... 69
15.4 Track pitch ... 69
15.4.1 Track pitch in zone reserved for BCA ... 69
15.4.2 Track pitch in embossed HFM area ... 69
15.4.3 Track pitch in recordable areas ... 70
15.4.4 Track pitch between embossed HFM area and recordable area ... 70
15.5 Track layout of HFM groove ... 70
15.5.1 General ... 70
15.5.2 Data format ... 71
15.5.3 Addressing and control data ... 72
15.5.4 Recording frames ... 75
15.6 Track layout of wobbled grooves ... 77
15.6.1 General ... 77
15.6.2 Modulation of wobbles ... 78
15.6.3 Wobble polarity ... 79
15.7 ADIP information ... 79
15.7.1 General ... 79
15.7.2 ADIP unit types ... 80
15.7.3 ADIP word structure ... 81
15.7.4 ADIP data structure ... 82
15.7.5 ADIP error correction ... 86
15.8 Disk information in ADIP aux frame ... 88
15.8.1 General ... 88
15.8.2 Error protection for disk information aux frames ... 89
15.8.3 Disk information data structure ... 90

16 General description of information zone ... 137
16.1 General ... 137
16.2 Format of information zone on triple-layer disk ... 137
16.3 Format of information zone on quadruple-layer disk ... 137

17 Layout of recordable area of information zone ... 137

18 Inner zone(s) ... 146
18.1 General ... 146
18.2 Permanent information and control data (PIC) zone ... 153
18.2.1 Genarel ... 153
18.2.2 Content of PIC zone ... 153
18.2.3 Emergency brake ... 155
18.3 Recordable area of lead-in zone of TL disk ... 157
18.3.1 Protection zone 2 ... 157
18.3.2 Buffer ... 157
18.3.3 INFO 2/Reserved 8 ... 157

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18.3.4 INFO 2/Reserved 7 157
18.3.5 INFO 2/Reserved 6 157
18.3.6 INFO 2/Reserved 5 158
18.3.7 INFO 2/PAC 2 158
18.3.8 INFO 2/DMA 2 158
18.3.9 INFO 2/Control data 2 158
18.3.10 INFO 2/Buffer 2 158
18.3.11 OPC 0/Test zone 158
18.3.12 Usage of OPC areas 158
18.3.13 OPC 0/OPC 0 buffer 160
18.3.14 TDMA 0 160
18.3.15 INFO 1/Pre-write area 160
18.3.16 INFO 1/Drive area 160
18.3.17 INFO 1/DMA 1 161
18.3.18 INFO 1/Control data 1 161
18.3.19 INFO 1/PAC 1 161
18.4 Recordable area of inner zone 1 of TL disk 161
18.4.1 Buffer 161
18.4.2 OPC 1/Test zone 161
18.4.3 Reserved 162
18.4.4 INFO 2/Reserved 8 162
18.4.5 INFO 2/Reserved 7 162
18.4.6 INFO 2/Reserved 6 162
18.4.7 INFO 2/Reserved 5 162
18.4.8 INFO 2/PAC 2 162
18.4.9 INFO 2/DMA 2 162
18.4.10 INFO 2/Control data 2 162
18.4.11 INFO 2/Buffer 2 162
18.4.12 TDMA 1 162
18.4.13 Reserved 163
18.4.14 INFO 1/Pre-write area 163
18.4.15 INFO 1/Drive area 163
18.4.16 INFO 1/DMA 1 163
18.4.17 INFO 1/Control data 1 163
18.4.18 INFO 1/PAC 1 163
18.5 Recordable area of inner zone 2 of TL disk 163
18.5.1 Buffer 163
18.5.2 OPC 2/Test zone 163
18.5.3 OPC 2/OPC 2 buffer 163
18.5.4 Reserved 163
18.5.5 INFO 2/Reserved 8 163
18.5.6 INFO 2/Reserved 7 164
18.5.7 INFO 2/Reserved 6 164
18.5.8 INFO 2/Reserved 5 164
18.5.9 INFO 2/Reserved 164
18.5.10 INFO 2/DMA 2 164
18.5.11 INFO 2/Control data 2 164
18.5.12 INFO 2/Buffer 2 164
18.5.13 TDMA 2 164
18.5.14 Buffer 164
18.5.15 INFO 1/Pre-write area 164
18.5.16 INFO 1/Drive area 165
18.5.17 INFO 1/DMA 1 165
18.5.18 INFO 1/Control data 1 165
18.5.19 INFO 1/Reserved 165
18.6 Recordable area of lead-in zone of QL disk 165
18.6.1 Protection zone 2 165
18.6.2 Buffer 165

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18.6.3 INFO 2/Reserved 8 165
18.6.4 INFO 2/Reserved 7 165
18.6.5 INFO 2/Reserved 6 165
18.6.6 INFO 2/Reserved 5 165
18.6.7 INFO 2/PAC 2 166
18.6.8 INFO 2/DMA 2 166
18.6.9 INFO 2/Control data 2 166
18.6.10 INFO 2/Buffer 2 166
18.6.11 OPC 0/Test zone 166
18.6.12 Buffer 166
18.6.13 INFO 1/Pre-write area 166
18.6.14 INFO 1/Drive area 166
18.6.15 INFO 1/DMA 1 166
18.6.16 INFO 1/Control data 1 166
18.6.17 INFO 1/PAC 1 167
18.7 Recordable area of inner zone 1 of QL disk 167
18.7.1 Buffer 167
18.7.2 OPC 1/Test zone 167
18.7.3 INFO 2/Reserved 8 167
18.7.4 INFO 2/Reserved 7 167
18.7.5 INFO 2/Reserved 6 167
18.7.6 INFO 2/Reserved 5 167
18.7.7 INFO 2/PAC 2 167
18.7.8 INFO 2/DMA 2 167
18.7.9 INFO 2/Control data 2 168
18.7.10 INFO 2/Buffer 2 168
18.7.11 TDMA 0 168
18.7.12 Buffer 168
18.7.13 INFO 1/Pre-write area 168
18.7.14 INFO 1/Drive area 168
18.7.15 INFO 1/DMA 1 168
18.7.16 INFO 1/Control data 1 168
18.7.17 INFO 1/PAC 1 168
18.8 Recordable area of inner zone 2 of QL disk 168
18.8.1 Buffer 168
18.8.2 INFO 2/Reserved 8 168
18.8.3 INFO 2/Reserved 7 169
18.8.4 INFO 2/Reserved 6 169
18.8.5 INFO 2/Reserved 5 169
18.8.6 INFO 2/Reserved 169
18.8.7 INFO 2/DMA 2 169
18.8.8 INFO 2/Control data 2 169
18.8.9 INFO 2/Buffer 2 169
18.8.10 TDMA 1 169
18.8.11 Buffer 169
18.8.12 OPC 2/Test zone 169
18.8.13 OPC 2/OPC 2 buffer 170
18.8.14 TDMA 2 170
18.8.15 INFO 1/Pre-write area 170
18.8.16 INFO 1/Drive area 170
18.8.17 INFO 1/DMA 1 170
18.8.18 INFO 1/Control data 1 170
18.8.19 INFO 1/Reserved 170
18.9 Recordable area of lead-out zone of QL disk 170
18.9.1 OPC 3/Test zone 170
18.9.2 Buffer 170
18.9.3 INFO 2/Reserved 8 170
18.9.4 INFO 2/Reserved 7 171

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18.9.5 INFO 2/Reserved 6 171
18.9.6 INFO 2/Reserved 5 171
18.9.7 INFO 2/Reserved 171
18.9.8 INFO 2/DMA 2 171
18.9.9 INFO 2/Control data 2 171
18.9.10 INFO 2/Buffer 2 171
18.9.11 TDMA 3 171
18.9.12 INFO 1/Pre-write area 171
18.9.13 INFO 1/Drive area 171
18.9.14 INFO 1/DMA 1 172
18.9.15 INFO 1/Control data 1 172
18.9.16 INFO 1/Reserved 172

19 Data zone 172

20 Outer zones 172
20.1 General 172
20.2 Recordable area of outer zones 174
20.2.1 INFO 3/Buffer 4 174
20.2.2 INFO 3/DMA 3 174
20.2.3 INFO 3/Control data 3 174
20.2.4 Angular buffer 174
20.2.5 INFO 4/DMA 4 174
20.2.6 INFO 4/Control data 4 174
20.2.7 INFO 4/Buffer 6 174
20.2.8 DCZ 0/Test zone, DCZ 1/Test zone, DCZ 2/Test zone and DCZ 3/Test zone 174
20.2.9 Usage of DCZ area 174
20.2.10 Protection zone 3 176

21 Physical access control clusters 176
21.1 General 176
21.2 Layout of PAC zones 177
21.3 General structure of PAC clusters 177
21.4 IS1 and IS2 PAC clusters 181

22 Disk management 181
22.1 General 181
22.2 Recording management 182
22.2.1 General 182
22.2.2 Sequential recording mode (SRM) 182
22.2.3 Recording user data in SRR 182
22.2.4 SRR status 182
22.2.5 Closing SRR 183
22.3 Temporary disk management areas (TDMA) 183
22.3.1 General 183
22.3.2 TDMA access indicators 183
22.4 Disk management structure (DMS) 184
22.4.1 General 184
22.4.2 Temporary disk management structure (TDMS) 184
22.4.3 TDMS in sequential recording mode 185
22.4.4 Temporary disk definition structure (TDDS) 186
22.4.5 Temporary defect list (TDFL) 191
22.4.6 Sequential recording range information (SRRI) 193
22.5 Unrecorded (blank) disk structure 195
22.5.1 General 195
22.5.2 Pre-recorded areas on unrecorded disk 195
22.5.3 Pre-recorded BCA 202
22.5.4 Pre-recorded INFO 2/Reserved 5, Reserved 8 and Pre-recorded INFO 1/Pre-write area 202
22.5.5 Pre-recorded INFO 1/PAC 1 and Pre-recorded INFO 2/PAC 2 202

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22.5.6 OPC 0/Test zone, OPC 1/Test zone, OPC 2/Test zone and OPC 3/Test zone 202
22.5.7 TDMA 0 203
22.5.8 Initialization of disk 203
22.6 Recorded (closed) disk structure 203
22.6.1 General 203
22.6.2 DMA zones 203
22.6.3 Disk management structure (DMS) 204

23 Assignment of logical sector numbers (LSNs) 206

24 Characteristics of grooved areas 207

25 Method of testing for grooved area 208
25.1 General 208
25.2 Environment 208
25.3 Reference drive 208
25.3.1 General 208
25.3.2 Read power 208
25.3.3 Read channels 208
25.3.4 Tracking requirements 208
25.3.5 Scanning velocities 208
25.4 Definition of signals 209

26 Signals from HFM grooves 210
26.1 Push-pull polarity 210
26.2 Push-pull signal 210
26.3 Wobble signal 210
26.4 Jitter of HFM signal 210

27 Signals from wobbled grooves 211
27.1 Phase depth 211
27.2 Push-pull signal 211
27.3 Wobble signal 211
27.3.1 General 211
27.3.2 Measurement of I_{NWS} 212
27.3.3 Measurement of wobble CNR 212
27.3.4 Measurement of harmonic distortion of wobble 212

28 Characteristics of recording layer 212

29 Method of testing for recording layer 213
29.1 General 213
29.2 Environment 213
29.3 Reference drive 213
29.3.1 General 213
29.3.2 Read power 213
29.3.3 Read channels 213
29.3.4 Tracking requirements 213
29.3.5 Scanning velocities 213
29.4 Write conditions 214
29.4.1 Write pulse waveform 214
29.4.2 Write powers 214
29.4.3 Average power 215
29.4.4 Write conditions for i-MLSE measurement 215
29.5 Definition of signals 215

30 Signals from recorded areas 215
30.1 HF signals 215
30.2 Modulated amplitude 215
30.3 Reflectivity-modulation product 217
30.4 Asymmetry 217
30.5 ***i***-MLSE 217

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30.6 Read stability ... 218
31 Local defects ... 219
32 Characteristics of user data ... 219
33 Method of testing for user data ... 219
33.1 General ... 219
33.2 Environment ... 220
33.3 Reference drive ... 220
33.3.1 General ... 220
33.3.2 Read power ... 220
33.3.3 Read channels ... 220
33.3.4 Error correction ... 220
33.3.5 Tracking requirements ... 220
33.3.6 Scanning velocities ... 220
33.4 Error signals ... 220
34 Minimum quality of recorded information ... 222
34.1 Symbol error rate ... 222
34.2 Maximum burst errors ... 222
34.3 User-written data ... 222
35 BCA ... 222
Annex A (normative) **Thickness of transmission stacks in case of multiple layers ... 224**
Annex B (normative) **Measurement of reflectivity ... 227**
Annex C (normative) **Measurement of scratch resistance of cover layer ... 232**
Annex D (normative) **Measurement of repulsion of grime by cover layer ... 234**
Annex E (normative) **Measurement of wobble amplitude ... 237**
Annex F (normative) **Write pulse waveform for testing ... 242**
Annex G (normative) **Optimum power control (OPC) procedure for disk ... 250**
Annex H (normative) **HF signal pre-processing for i-MLSE(integrated maximum likelihood sequence error estimation) measurements ... 254**
Annex I (normative) **Measurement procedures ... 266**
Annex J (informative) **Measurement of birefringence ... 278**
Annex K (informative) **Measurement of thickness of cover layer and spacer layer ... 280**
Annex L (informative) **Measurement of impact resistance of cover layer ... 283**
Annex M (informative) **Groove deviation and the wobble amplitude ... 285**
Annex N (informative) **Guideline for write pulse adjustment using L-SEAT edge shift ... 287**
Annex O (normative) **Specific requirements for type TL/D disk ... 295**
Annex P (informative) **Bonding of type TL/D disk ... 297**
Bibliography ... 298

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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.

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 document 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 and IEC 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) or the IEC list of patent declarations received (see http://patents.iec.ch).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 23, *Digitally recorded media for information interchange and storage*.

This third edition cancels and replaces the second edition (ISO/IEC 30191:2015), which has been technically revised. It also incorporates the Amendment ISO/IEC 30191:2015/Amd.1 :2019.

The main change compared to the previous edition is the addition of requirements for physical access control and reserved area of BD application.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

In March 2002, the Blu-ray Disc Founders, or BDF, came together to create optical disk formats with the large capacity and high-speed transfer rates that would be needed for recording and reproducing high-definition video content.

The Blu-ray Disc Association (BDA) issued the first version of the Blu-ray Disc™ Recordable Format Part1 in October 2005, and Version 1.3 of the Blu-ray Disc™ Recordable Format Part 1 in April 2008, which enabled the recording velocity up to 6x. In June 2010, the BDA issued Blu-ray Disc™ Recordable Format Part 1 Version 2.0, which specifies the TL and QL of BD recordable disk.

To keep the compatibility of the removable medium in the market, just to make a standard is not enough, and it is necessary to check that the disks and devices can satisfy the specifications.The BDA also conducts verification activities for the disks and devices and has established more than 10 testing centers in Asia, Europe and the USA.

Blu-ray™ disks, players, recorders and PC drives/software based on BDA standards became popular all over the world. The BDA gave consumer applications the highest priority in the first few years. But it was known, of course, that international standardization would be required before many government entities and their contractors would be allowed to use Blu-ray Disc™. In January and February 2011, the BDA was formally requested to consider international standardization. The reason for this was to enable the inclusion of writable BDs, along with DVDs and CDs, in an International Standard specifying test methods for the estimation of lifetime of optical storage media for long-term data storage. In October 2011, the BDA responded that it had decided to pursue international standardization of the basic physical formats for the Recordable and Rewritable Blu-ray™ Format.

In December 2011, the BDA sent project proposals for international standardization of four formats. ISO/IEC 30190, ISO/IEC 30191, ISO/IEC 30192 and ISO/IEC 30193 were published in 2013.

A few additional specifications are required in order to write and read video-recording applications, such as the BDMV and BDAV formats, which have been specified by the BDA for use on BD recordable disks. These specifications, which are related to the BD application, the file system or the content protection system, are required for the disk, the generating system and the receiving system[1)].

The International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of a patent.

ISO and IEC take no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured ISO and IEC that he/she is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with ISO and IEC. Information may be obtained from the patent database available at www.iso.org/patents.

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NOTE Blu-ray™, Blu-ray Disc™ and the logos are trademarks of the Blu-ray Disc Association.

1) For more information of the BD application, the content-protection system and the additional requirements for the Blu-ray™ Format specifications, see http://www.blu-raydisc.info.

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Information technology — Digitally recorded media for information interchange and storage — 120 mm Triple Layer (100,0 Gbytes single sided disk and 200,0 Gbytes double sided disk) and Quadruple Layer (128,0 Gbytes single sided disk) BD Recordable disk

1 Scope

This document specifies the mechanical, physical and optical characteristics of a 120 mm recordable optical disk with a capacity of 100,0 Gbytes, 128,0 Gbytes or 200,0 Gbytes. It specifies the quality of the recorded and unrecorded signals, the format of the data and the recording method, thereby allowing for information interchange by means of such disks. User data can be written once and read many times using a non-reversible method. This disk is identified as BD recordable disk.

This document specifies the following:

— three related but different types of this disk;

— the conditions for conformance;

— the environments in which the disk is to be operated and stored;

— the mechanical and physical characteristics of the disk, so as to provide mechanical interchange between data processing systems;

— the format of the information on the disk, including the physical disposition of the tracks and sectors;

— the error correcting codes and the coding method used;

— the characteristics of the signals recorded on the disk, enabling data processing systems to read the data from the disk.

This document provides for interchange of disks between disk drives. Together with a standard for volume and file structure, it provides for full data interchange between data processing systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 646, *Information technology — ISO 7 bit coded character set for information interchange*

ISO 9352, *Plastics — Determination of resistance to wear by abrasive wheels*

ISO/IEC 30193, *Information technology — Digitally recorded media for information interchange and storage — 120 mm Triple Layer (100,0 Gbytes per disk) BD Rewritable disk*

IEC 60068-2-2, *Environmental testing — Part 2-2: Tests — Test B: Dry heat*

IEC 60068-2-30, *Environmental testing — Part 2-30: Tests — Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60950-1, *Information technology equipment — Safety — Part 1: General requirements*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 30193 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
case
housing for an optical disk, that protects the disk and facilitates disk interchange

3.2
mark polarity
polarity of reflectivity change when marks are recorded

4 Symbol and abbreviated terms

ac	alternating current	MSB	most significant byte
ADIP	address in pre-groove	msb	most significant bit
APC	automatic power control	MSK	minimum shift keying
AU	address unit	MW	monotone wobble
AUN	address unit number	NA	numerical aperture
BCA	burst-cutting area	NRZ	non-return-to-zero
BIS	burst-indicating subcode	NRZI	non-return-to-zero inverting
BPF	band-pass filter	NWA	next writable address
CAV	constant angular velocity	NWL	nominal wobble length
cbs	channel bits	OPU	optical pick-up unit
CNR	carrier-to-noise ratio	PAA	physical ADIP address
dc	direct current	PIC	permanent information and control data
DCZ	drive calibration zone	PLL	phase-lock loop
DDS	disk definition structure	PoA	post-amble
DFL	defect list	PP	push-pull
DI	disk information	pp	peak-to-peak
DL	dual layer	PrA	pre-amble
DMA	disk management area	PSN	physical sector number
DMS	disk management structure	QL	quadruple layer
DSV	digital sum value	R_H	relative humidity

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