

Second edition
2016-06-15

Corrected version
2017-01

**Information technology — Digitally
recorded media for information
interchange and storage — 120 mm
Single Layer (25,0 Gbytes per disk)
and Dual Layer (50,0 Gbytes per disk)
BD Rewritable disk**

ISO/IEC 30192:2016

<https://standards.iteh.ai/catalog/standards/sis/59d8c814-f196-461d-a51e-18471d82c85f/iso-iec-30192-2016>

*Technologies de l'information — Supports enregistrés
numériquement pour échange et stockage d'information — Disques
BD réinscriptibles de 120 mm simple couche (25,0 Go par disque) et
double couche (50,0 Go par disque)*

Reference number
ISO/IEC 30192:2016(E)



© ISO/IEC 2016

iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO/IEC 30192:2016

<https://standards.iteh.ai/catalog/standards/sist/59d8c814-f196-421d-a51e-18471df82c8f/iso-iec-30192-2016>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2016, Published in Switzerland

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

Ch. de Blandonnet 8 • CP 401

CH-1214 Vernier, Geneva, Switzerland

Tel. +41 22 749 01 11

Fax +41 22 749 09 47

copyright@iso.org

www.iso.org

Contents	Page
1 Scope	1
2 Conformance	2
2.1 Optical Disk	2
2.2 Generating system	2
2.3 Receiving system	2
2.4 Compatibility statement	2
3 Normative references	2
4 Terms and definitions	3
5 Conventions and notations	7
5.1 Terminology	7
5.1.1 Meaning of words	7
5.1.2 Levels of grouping	7
5.2 Representation of numbers	7
5.3 Integer calculus	8
5.4 Names	8
6 List of acronyms	8
7 General descriptions of disk	11
8 General requirements	13
8.1 Environments	13
8.1.1 Test environment	13
8.1.2 Operating environment	13
8.1.3 Storage environment	14
8.1.4 Transportation	15
8.2 Safety requirements	15
8.3 Flammability	15
9 Reference drive	15
9.1 General	15
9.2 Environmental conditions	15
9.3 Optical system	15
9.4 Optical beam	17
9.5 HF read channel	17
9.6 Radial PP read channel	18
9.7 Disk Clamping	18
9.8 Rotation of the disk and Measurement Velocity	18
9.9 Normalized servo transfer function	19
9.10 Measurement Velocity and Reference servo for axial tracking	20
9.11 Measurement Velocity and Reference servo for radial tracking	21
10 Dimensional characteristics	22
10.1 General	22
10.2 Disk reference planes and reference axis	22
10.3 Overall dimensions	23
10.4 First transition Area	24
10.5 Protection ring	24
10.6 Clamping Zone	24
10.7 Second transition Area	24
10.8 Information Area	25
10.8.1 General	25
10.8.2 Subdivisions of Information Zone on SL disk	25
10.8.3 Subdivisions of Information Zone on DL disks	26
10.9 Rim Area	27

11	Mechanical characteristics	27
11.1	Mass	27
11.2	Moment of inertia	27
11.3	Dynamic imbalance	27
11.4	Axial runout	27
11.4.1	General.....	27
11.4.2	Residual axial tracking error	28
11.5	Radial runout.....	28
11.5.1	General.....	28
11.5.2	Residual radial tracking error on SL disks	28
11.5.3	Residual radial tracking error on DL disks	29
11.6	Durability of Cover Layer	29
11.6.1	Impact resistance of Cover Layer	29
11.6.2	Scratch resistance of Cover Layer.....	29
11.6.3	Repulsion of fingerprints by Cover Layer	29
12	Optical characteristics in Information Area	29
12.1	General.....	29
12.2	Refractive index of Transmission Stacks (TS)	29
12.3	Thickness of Transmission Stack(s)	30
12.3.1	Thickness of Transmission Stack of SL disks	30
12.3.2	Thickness of Transmission Stack of DL disks	30
12.4	Reflectivity	31
12.4.1	Reflectivity of Recording Layer of SL disks	31
12.4.2	Reflectivity of Recording Layer of DL disks	32
12.5	Birefringence.....	32
12.6	Angular deviation.....	32
13	Data format.....	33
13.1	General.....	33
13.2	Data Frames	35
13.3	Error-Detection Code (EDC)	35
13.4	Scrambled Data Frame	35
13.5	Data Block	36
13.6	LDC Block.....	37
13.7	LDC Code words	37
13.8	LDC Cluster	38
13.8.1	General.....	38
13.8.2	First interleave step	38
13.8.3	Second interleaving step	39
13.9	Addressing and Control Data	41
13.9.1	General.....	41
13.9.2	Address Units.....	41
13.9.3	User-Control Data	44
13.9.4	Byte/Bit assignments for User-Control Data	45
13.10	Access Block.....	45
13.11	BIS Block	47
13.12	BIS Code words	47
13.13	BIS Cluster.....	48
13.14	ECC Cluster	52
13.15	Recording Frames	53
13.16	Physical Cluster.....	53
13.17	17PP Modulation for Recordable data	53
13.17.1	General.....	53
13.17.2	Bit conversion rules	54
13.17.3	dc-control procedure.....	54
13.17.4	Frame Sync.....	54
13.18	Modulation and NRZI conversion.....	56
14	Physical Data Allocation and Linking.....	57
14.1	General.....	57
14.2	Recording-Unit Block (RUB).....	57
14.2.1	General.....	57

14.2.2	Data Run-in	57
14.2.3	Data Run-out	58
14.2.4	Guard_3 field	59
14.3	Locating data relative to wobble addresses	60
14.3.1	General	60
14.3.2	Start-Position Shift (SPS)	60
15	Track format	61
15.1	General	61
15.2	Track shape	62
15.3	Track Path	64
15.4	Track Pitch	64
15.4.1	Track Pitch in BCA Zone	64
15.4.2	Track Pitch in Embossed HFM Areas	64
15.4.3	Track Pitch in Rewritable Areas	64
15.4.4	Track Pitch between Embossed HFM Area and Rewritable Area	65
15.5	Track layout of HFM Groove	65
15.5.1	General	65
15.5.2	Data Format	65
15.5.3	Addressing and Control Data	66
15.5.4	Recording Frames	69
15.6	Track layout of Wobbled Groove(s)	71
15.6.1	General	71
15.6.2	Modulation of wobbles	72
15.7	ADIP Information	73
15.7.1	General	73
15.7.2	ADIP-Unit Types	73
15.7.3	ADIP Word structure	75
15.7.4	ADIP Data structure	76
15.7.5	ADIP Error Correction	78
15.8	Disk Information in ADIP Aux Frame	80
15.8.1	General	80
15.8.2	Error protection for Disk-Information Aux Frames	80
15.8.3	Disk-Information Data structure	81
16	General description of Information Zone	112
16.1	General	112
16.2	Format of Information Zone on Single-Layer disk	112
16.3	Format of Information Zone on Dual-Layer disk	112
17	Layout of Rewritable Area of Information Zone	112
18	Inner Zone	116
18.1	General	116
18.2	Permanent Information & Control data (PIC) Zone	118
18.2.1	General	118
18.2.2	Content of PIC Zone	118
18.2.3	Emergency Brake	119
18.3	Rewritable Area of Inner Zone(s)	121
18.3.1	Protection-Zone 2	121
18.3.2	INFO 2 / Reserved 8	121
18.3.3	INFO 2 / Reserved 7	121
18.3.4	INFO 2 / Reserved 6	121
18.3.5	INFO 2 / Reserved 5	122
18.3.6	INFO 2 / PAC 2	122
18.3.7	INFO 2 / DMA 2	122
18.3.8	INFO 2 / Control Data 2	122
18.3.9	INFO 2 / Buffer 2	122
18.3.10	OPC / Test Zone	122
18.3.11	Reserved	122
18.3.12	INFO1 / Buffer 1	122
18.3.13	INFO 1 / Drive Area (optional)	122
18.3.14	INFO 1 / Reserved 3	124
18.3.15	INFO 1 / Reserved 2	124

18.3.16	INFO 1 / Reserved 1	124
18.3.17	INFO 1 / DMA 1	124
18.3.18	INFO1 / Controle Data 1	124
18.3.19	INFO1 / PAC 1	124
19	Data Zone	124
20	Outer Zone(s)	125
20.1	General	125
20.2	INFO 3 / Buffer 4	126
20.3	INFO 3 / DMA 3	126
20.4	INFO 3 / Control Data 4	126
20.5	Angular buffer	126
20.6	INFO 4 / DMA 4	126
20.7	INFO 4 / Control Data 4	126
20.8	INFO 4 / Buffer 6	126
20.9	Protection-Zone 3	126
21	Physical-Access Control Clusters	127
21.1	General	127
21.2	Layout of PAC Zones	127
21.3	General structure of PAC Clusters	128
21.4	Primary PAC Cluster (mandatory)	131
21.5	Disk Write-Protect PAC Cluster (optional)	134
21.6	IS1 and IS2 PAC Clusters	137
22	Disk Management	138
22.1	General	138
22.2	Disk-Management Structure (DMS)	138
22.2.1	General	138
22.2.2	Disk-Definition Structure (DDS)	139
22.2.3	Defect List (DFL)	143
22.2.4	Defect-List Header (DLH)	143
22.2.5	List of Defects	144
22.2.6	DFL Entries	146
23	Assignment of Logical-Sector Numbers (LSNs)	147
24	Characteristics of Grooved Areas	148
25	Method of testing for Grooved Area	148
25.1	General	148
25.2	Environment	148
25.3	Reference drive	148
25.3.1	General	148
25.3.2	Read power	148
25.3.3	Read channels	148
25.3.4	Tracking requirements	149
25.3.5	Scanning velocity	149
25.4	Definitions of signals	149
26	Signals from HFM Grooves	151
26.1	Push-Pull signal	151
26.2	HFM Wobble signal	151
26.3	Jitter of HFM signal	151
27	Signals from Wobbled Groove(s)	152
27.1	Phase depth	152
27.2	Push-Pull signal	152
27.3	Wobble signal	152
27.3.1	General	152
27.3.2	Measurement of NWS	152
27.3.3	Measurement of wobble CNR	152
27.3.4	Measurement of harmonic distortion requirements	153
28	Characteristics of Recording Layer	153

29	Method of testing for Recording Layer	154
29.1	General	154
29.2	Environment.....	154
29.3	Reference drive.....	154
29.3.1	General	154
29.3.2	Read power	154
29.3.3	Read channels	154
29.3.4	Tracking requirements.....	154
29.3.5	Scanning velocities	154
29.4	Write conditions	154
29.4.1	Write-pulse waveform.....	154
29.4.2	Write powers	155
29.4.3	Write conditions for jitter measurement	155
29.4.4	Write conditions for cross-erase measurement.....	155
29.4.5	Write conditions for inter-velocity overwrite measurements	155
29.5	Definition of signals	156
30	Signals from Recorded Areas	156
30.1	HF signals	156
30.2	Modulated amplitude.....	156
30.3	Reflectivity-Modulation product	157
30.4	Asymmetry	157
30.5	Jitter	157
30.6	Cross-erase.....	158
30.7	Inter-velocity overwrite	158
30.8	Read stability	159
31	Local defects.....	160
32	Characteristics of User Data	160
33	Method of testing for User Data.....	160
33.1	General	160
33.2	Environment.....	160
33.3	Reference drive.....	161
33.3.1	General	161
33.3.2	Read power	161
33.3.3	Read channels	161
33.3.4	Error Correction.....	161
33.3.5	Tracking requirements.....	161
33.3.6	Scanning velocities	161
33.4	Definition of signals	161
34	Minimum quality of recorded information	163
34.1	Random Symbol Error Rate	163
34.2	Maximum burst errors.....	163
34.3	User-written Data.....	163
35	BCA.....	164
Annex A	(normative) Thickness of Transmission Stacks in case of multiple layers	165
A.1	General	165
A.2	Refractive Index n_i of all layers in Cover Layer and Spacer Layer	165
A.3	Thickness variation of the Transmission Stack.....	165
A.4	Example of thickness calculation for SL	165
Annex B	(normative) Measurement of reflectivity	166
B.1	General	166
B.2	Calibration method.....	167
B.3	Measuring method.....	168
Annex C	(normative) Measurement of scratch resistance of Cover Layer	169
C.1	General	169
C.2	Taber Abrasion test.....	169
Annex D	(normative) Measurement of repulsion of grime by Cover Layer.....	171
D.1	General	171

D.2	Specifications of stamp	171
D.3	Preparation of ink	172
D.4	Preparation of ink pad	172
D.5	Using ink pad and stamp	173
Annex E	(normative) Measurement of wobble amplitude.....	174
E.1	Measurement methods.....	174
E.2	Calibration of filters	178
Annex F	(normative) Write-pulse waveform for testing.....	179
F.1	General write-pulse waveform.....	179
F.2	N-1 write strategy A	179
F.3	N-1 write strategy B	181
F.4	N/2 write strategy	183
F.5	Definition of pulse widths and rise and fall times	186
Annex G	(normative) Optimum Power Control (OPC) procedure for disk.....	187
G.1	General.....	187
G.2	Mathematical model for modulation versus power function	187
G.3	Procedure for determination of OPC parameters for disk.....	188
G.4	Write-power window	189
Annex H	(normative) HF signal pre-processing for jitter measurements	190
H.1	General.....	190
H.2	General implementation of equalizer	190
H.3	Conventional Equalizer circuit	191
H.4	Limit Equalizer circuit	192
H.5	Specifications of supporting circuits	193
H.5.1	Amplifiers and filters	193
H.5.2	Open-loop transfer function for PLL	194
H.5.3	Slicer	195
H.6	Condition for measurement.....	195
H.7	Jitter measurement.....	196
Annex I	(normative) Measurement procedure.....	197
I.1	General.....	197
I.2	Initial adjustments of Reference drive.....	197
I.3	Jitter measurement.....	197
I.4	Modulated amplitude measurements	198
I.5	Measurements of Resolution I_{2pp} / I_{8pp} and I_{3pp} / I_{8pp}	198
I.5.1	Method for measuring I_{2pp} and I_{8pp}	198
I.5.2	I_{3pp} / I_{8pp} , I_{8pp} / I_{8H} and asymmetry measurement procedure.....	199
I.6	Tracking-error signal measurements (PP_{norm} measurement procedure)	200
I.7	Residual error of axial tracking measurement procedure.....	201
I.8	Residual error of radial tracking measurement procedure	202
I.9	Random SER measurement.....	202
Annex J	(informative) Measurement of birefringence	203
J.1	Principle of measurement	203
J.2	Measurements conditions	203
J.3	Example of measurement procedure.....	203
J.4	Interchangeability of measuring results	204
Annex K	(informative) Measurement of thickness of Cover Layer and Spacer Layer	205
K.1	Focusing method	205
K.2	Interferometer method	206
Annex L	(informative) Measurement of impact resistance of Cover Layer	208
L.1	General.....	208
L.2	Recommendation for drives	208
L.3	Measurements of impact resistance of Cover Layer	208
Annex M	(informative) Groove deviation and wobble amplitude	210
M.1	Relation between normalized wobble signal and wobble amplitude	210
M.2	Tolerance of normalized wobble signal	210

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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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).

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 \(standards.iteh.ai\)](http://Foreword - Supplementary information (standards.iteh.ai))

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 23, *Digitally recorded media for information interchange and storage*.

This second edition cancels and replaces the first edition (ISO/IEC 30192:2013), of which it constitutes a minor revision. It also incorporates the Technical Corrigendum ISO/IEC 30192:2013/Cor 1:2015.

This corrected version of ISO/IEC 30192:2017 incorporates the following corrections as well as other minor editorial modifications:

- in Annex F, the two Figures previously entitled “F.6.” have been corrected and one figure was re-numbered as Figure F.7.;
- Figure H.2. was replaced.

Introduction

In March 2002, nine companies known as 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 of high-definition video content. This joint effort turned out to be fruitful and the BDF issued the first version of its Blu-ray Disc™ Rewritable Format Part1 Version 1.0, in June of 2002.

Then, in October 2004, more than a hundred companies joined and the BDF became an open forum called the Blu-ray Disc Association (BDA). The BDA issued Version 2.1 of the Blu-ray Disc™ Rewritable Format Part1 in October 2005 and Version 3.0 in June of 2010.

By the end of 2010, over a hundred million of Blu-ray Disc™ had already been shipped and the Blu-ray™ devices such as players, recorders, game consoles and PC drives were in use all over the world.

The BDA also conducts verification activities for both disks and devices and has established more than ten Testing Centres in Asia, Europe and the USA.

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 February and January of 2011, ISO/IEC JTC 1/SC 23 and JIIMA (Japan Image and Information Management Association) formally requested the BDA 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 president of the BDA responded that his organization had decided to pursue International Standards of the basic physical formats for the Recordable and Rewritable Blu-ray Disc™.

In December 2011, BDA sent project proposals for the International standardization of four formats to ISO/IEC JTC 1/SC 23 via the Japan national body. They are 120 mm Single Layer (25,0 Gbytes per disk) and Dual Layer (50,0 Gbytes per disk) BD Recordable disks, 120 mm Single Layer (25,0 Gbytes per disk) and Dual Layer (50,0 Gbytes per disk) BD Rewritable disks, 120 mm Triple Layer (100,0 Gbytes per disk) and Quadruple Layer (128,0 Gbytes per disk) BD Recordable disks and 120 mm Triple Layer (100,0 Gbytes per disk) BD Rewritable disk.

This International Standard specifies the mechanical, physical and optical characteristics of a 120 mm rewritable optical disk with a capacity of 25,0 Gbytes or 50,0 Gbytes.

Some technical errors were found during the editorial work for JIS X 6232, which is the Japanese Industrial Standard identical with ISO/IEC 30192:2013. In December of 2014, a Defect Report was submitted by the Japan national body of ISO/IEC JTC 1/SC 23. The project editor proposed a Draft Technical Corrigendum for ISO/IEC 30192:2013 and it was approved by ISO/IEC JTC 1/SC 23 in May of 2015. This International Standard is the updated First edition of ISO/IEC 30192:2013, including the Technical Corrigendum and additional corrections for some minor editorial errors.

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 Application, the file system and the Content-protection system, are required for the disk, the generating system and the receiving system. For more information of the Application, the Content-protection system and the additional requirements for the Blu-ray™ Format specifications, see <http://www.blu-raydisc.info>.

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 patents.

ISO and IEC take no position concerning the evidence, validity and scope of these patent rights.

The holders of these patent rights have assured ISO and IEC that they are willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of holders of these patent rights are registered with ISO and IEC. Information may be obtained from the following.

Hitachi Consumer Electronics Co., Ltd.
Intellectual Property Management
292 Yoshida-cho, Totsuka-ku, Yokohama 244-0817 Japan

Hitachi, Ltd.,
IT Platform R&D Management Division Patent Strategy
322-2 Nakazato, Odawara-shi, Kanagawa-Ken 250-0872 Japan

Panasonic Corporation
Intellectual Property Center
OBP Panasonic Tower 8th Floor, 2-1-61, Shiromi, Chuoh-ku, Osaka, 540-6208, Japan

Pioneer Corporation
Intellectual Property Division, Legal and Intellectual Property Division,
1-1, Shin-Ogura, Saiwai-ku, Kawasaki-Shi, Kanagawa, 212-0031, Japan

Sony Corporation
IP Asset Management Department, Intellectual Property Division,
1-7-1, Konan, Minato-ku, Tokyo, 108-0075, Japan

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 30192:2016

ISO (www.iso.org/patents) and IEC (<http://patents.iec.ch>) maintain on-line databases of patents relevant to their standards. Users are encouraged to consult the databases for the most up to date information concerning patents.

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

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

ISO/IEC 30192:2016

<https://standards.iteh.ai/catalog/standards/sist/59d8c814-f196-421d-a51e-18471df82c8f/iso-iec-30192-2016>

Information technology — Digitally recorded media for information interchange and storage — 120 mm Single Layer (25,0 Gbytes per disk) and Dual Layer (50,0 Gbytes per disk) BD Rewritable disk

1 Scope

This International Standard specifies the mechanical, physical and optical characteristics of a 120 mm rewritable optical disk with a capacity of 25,0 Gbytes or 50,0 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, read and overwritten many times using a reversible method. A conforming disk is identified as a BD Rewritable disk.

This International Standard specifies the following:

- two related but different Types of this disk;
- conditions for conformance;
- environments in which the disk is to be operated and stored;
- mechanical and physical characteristics of the disk, which allow mechanical interchange between data processing systems;
- format of the information on the disk, including the physical disposition of the Tracks and Sectors;
- error-correcting codes and coding method used;
- characteristics of the signals recorded on the disk, which enable data processing systems to read data from the disk.

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

2 Conformance

2.1 Optical Disk

A claim of conformance with this International Standard shall specify the Type implemented. An optical disk shall be in conformance with this International Standard if it meets all mandatory requirements specified for its Type.

2.2 Generating system

A generating system shall be in conformance with this International Standard if the optical disk it generates is in accordance with 2.1.

2.3 Receiving system

A receiving system shall be in conformance with this International Standard if it is able to handle both Types of optical disks according to 2.1.

2.4 Compatibility statement

A claim of conformance by a Generating or Receiving system with this International Standard shall include a statement listing any other standards supported. This statement shall specify the numbers of the standards, the optical disk Types supported (where appropriate) and whether support includes reading only or both reading and writing.

3 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 646, *Information technology — ISO 7-bit coded character set for information interchange*

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

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

IEC 60068-2-30, *Environment 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*

4 Terms and definitions

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

4.1

Application

application specified for a *BD* (4.2), for instance a video application, which requires areas for a Content-protection system and for its own Defect-Management system on the disk

4.2

BD

disk having a *Cover Layer* (4.4) around 0,1 mm thick and a *Substrate* (4.37) around 1,1 mm thick on which data is read or recorded by an OPU using 405 nm laser diode and NA = 0,85 lens

Note 1 to entry: User Data recorded on the disk is formatted using 17PP modulation and an LDC+BIS code.

4.3

Channel bit

element by which the binary value ZERO or ONE is represented by *Pits* (4.24)/*Marks* (4.18) and *Spaces* (4.36) on the disk

4.4

Cover Layer

transparent layer with precisely-controlled optical properties that covers the Recording Layer closest to the Entrance surface of the disk

4.5

Data Zone *n*

area between the Inner Zone and the Outer Zone on *Layer Ln* (4.17)

4.6

Defective Cluster

Cluster in the *User-Data Area* (4.41) that has been registered in the Defect List because it has become unreliable or uncorrectable

4.7

Digital-Sum Value

DSV

arithmetic sum obtained from a bit stream by assigning the decimal value +1 to *Channel bits* (4.3) set to ONE and the decimal value –1 to channel bits set to ZERO

4.8

Disk reference plane

plane defined by the perfect flat annular surface of an ideal spindle onto which the Clamping Area of the disk is clamped that is normal to the axis of rotation

4.9

Embossed HFM Area

area on the disk where information has been stored by means of an *HFM Groove* (4.13) during the manufacture of the disk

4.10

Entrance surface

surface of the disk onto which the optical beam first impinges

4.11

Erased Groove

blank Groove on the disk that has been erased by irradiating the Track using only erase power levels P_{E10} and P_{E20} as determined by the OPC algorithm