

# ISO/IEC 17345:2006-12 (E)

## Information technology - Data Interchange on 130 mm Rewritable and Write Once Read Many Ultra Density Optical (UDO) Disk Cartridges - Capacity: 30 Gbytes per Cartridge - First Generation

---

<b>Contents</b>		<b>Page</b>
Foreword .....		vii
Introduction .....		viii
<b>Section 1 -- General .....</b>		<b>1</b>
1 <b>Scope .....</b>		<b>1</b>
2 <b>Conformance .....</b>		<b>2</b>
2.1    Optical disk .....		2
2.2    Generating system .....		2
2.3    Receiving system .....		2
2.4    Compatibility statement .....		2
3 <b>Normative references .....</b>		<b>2</b>
4 <b>Terms and definitions .....</b>		<b>2</b>
5 <b>Conventions and notations .....</b>		<b>6</b>
5.1    Representation of numbers .....		6
5.2    Names .....		6
6 <b>Acronyms .....</b>		<b>6</b>
7 <b>General description .....</b>		<b>7</b>
8 <b>General requirement .....</b>		<b>8</b>
8.1    Environments .....		8
8.2    Temperature shock .....		9
8.3    Safety requirements .....		9
8.4    Flammability .....		9
9 <b>Reference Drive .....</b>		<b>9</b>
9.1    Optical system .....		9
9.2    Optical beam .....		10
9.3    Read Channel .....		11
9.4    Tracking .....		11
9.5    Rotation of the disk .....		11
<b>Section 2 -- Mechanical and physical characteristics .....</b>		<b>11</b>
10 <b>Dimensional and physical characteristics of the case .....</b>		<b>11</b>
10.1   General description of the case .....		11
10.2   Relationship of Sides A and B .....		11
10.3   Reference axes and case reference planes .....		12
10.4   Case drawings .....		12
10.5   Dimensions of the case .....		12
10.6   Mechanical characteristics .....		19
10.7   Drop test .....		20

10.8	Electro-static discharge test .....	20
11	Dimensional, mechanical, and physical characteristics of the disk .....	31
11.1	General description of the disk .....	31
11.2	Reference axis and plane of the disk .....	32
11.3	Dimensions of the disk .....	32
11.4	Mechanical characteristics .....	34
11.5	Optical characteristics .....	36
12	Interface between cartridge and drive .....	37
12.1	Clamping method .....	37
12.2	Clamping force .....	37
12.3	Capture cylinder .....	38
12.4	Disk position in operating condition .....	38
Section 3 -- Format of information .....		40
13	Track and Header geometry .....	40
13.1	Track and Header shape .....	40
13.2	Wobble groove .....	41
13.3	Mirror Area .....	41
13.4	Direction of spiral .....	41
13.5	Track pitch .....	41
13.6	Physical Track number .....	42
14	Track format .....	43
14.1	Physical Track layout .....	43
14.2	Physical Block Address (PBA) .....	43
14.3	Sectors with Mirror Area .....	46
14.4	Radial alignment .....	47
15	Sector format .....	47
15.1	Sector layout .....	47
15.2	IDL, IDG .....	49
15.3	Blank fields .....	50
15.4	Quadrature Wobble Marks (QWM) .....	50
15.5	Gap .....	51
15.6	Guard .....	51
15.7	Verify and Protect (VAP) .....	52
15.8	VFO1, VFO2 .....	52
15.9	Sync .....	53
15.10	Data field .....	53
15.11	Postamble (PA) .....	54
15.12	Buffer .....	54
15.13	Transition Area (TA) .....	55
16	Recording codes .....	55
16.1	Preformatted Header .....	55
16.2	Data field .....	55
17	Formatted Zone .....	57
17.1	General description of the Formatted Zone .....	57
17.2	Division of the Formatted Zone .....	57
17.3	Drive test data patterns .....	64
17.4	SDI Zones usage .....	64
17.5	DDS Zones Usage .....	66
18	Layout of the User Zones .....	67
18.1	General description of the User Zones .....	67
18.2	Divisions of the User Zones .....	67
18.3	User Area .....	67
18.4	Defect Management Area (DMA) .....	69

18.5	Disk Definition Structure (DDS) .....	71
19	Defect Management in the Rewritable (RW) and Write Once Read Many (WORM) Zones ...	73
19.1	Initialization of the disk .....	73
19.2	Certification .....	73
19.3	Disk not certified .....	74
19.4	Write procedure .....	75
19.5	Primary Defect List (PDL) format and content .....	75
19.6	Secondary Defect List (SDL) format and content .....	76
<b>Section 4 -- Characteristics of embossed information .....</b>		<b>77</b>
20	Embossed information - Method of testing .....	77
20.1	Environment .....	77
20.2	Use of the Reference Drive .....	77
20.3	Definition of signals .....	78
21	Signals from grooves and lands .....	79
21.1	Ratio of groove to land signal .....	79
21.2	Ratio of groove/land to Mirror Area signal .....	79
21.3	Divided push-pull signal .....	80
21.4	Wobble signal .....	80
21.5	Phase depth .....	81
21.6	Track location .....	81
22	Signals from Headers .....	81
22.1	Reference reflectance ltop .....	81
22.2	Address Mark and ID signals .....	81
22.3	QWM signals .....	82
22.4	Timing mean and jitter .....	83
<b>Section 5 -- Characteristics of the recording layer .....</b>		<b>83</b>
23	Method of testing .....	83
23.1	Environment .....	83
23.2	Reference Drive .....	83
23.3	Write conditions .....	84
23.4	Erase power for Type RW media .....	86
23.5	Read power damage .....	86
24	Phase Change characteristics .....	86
24.1	Mark polarity .....	86
24.2	Rewrite cycles for Type RW media .....	86
25	Write characteristics .....	86
25.1	Resolution .....	86
25.2	Narrow-Band Signal-to-Noise Ratio (NBSNR) .....	87
25.3	Cross-talk ratio .....	88
25.4	Timing mean .....	88
25.5	Timing jitter .....	89
25.6	Asymmetry .....	89
26	Erase power determination for Type RW media .....	89
26.1	Cross-Erase for Type RW Media .....	90
<b>Section 6 -- Characteristics of user data .....</b>		<b>91</b>
27	User Data - Method of testing .....	91
27.1	Environment .....	91
27.2	Reference Drive .....	91
28	Minimum quality of a sector .....	92

28.1	Headers ID .....	92
28.2	User-written data .....	93
28.3	Wobble signal .....	93
29	Data interchange requirements .....	93
29.1	Tracking .....	93
29.2	User-written data .....	93
29.3	Quality of disk .....	93
Annex A (normative) Air cleanliness class 100 000 .....		94
Annex B (normative) Edge distortion test .....		96
Annex C (normative) Compliance test .....		98
Annex D (normative) Cartridge electro-static discharge test .....		101
Annex E (normative) Test method for measuring the adsorbent force of the hub .....		102
Annex F (normative) CRC for ID fields .....		104
Annex G (normative) Data field scrambler implementation .....		105
Annex H (normative) Interleave, CRC, ECC, Resync, and Reference for the Data field .....		107
Annex I (normative) Drive Information Record (DIR) usage .....		112
Annex J (normative) Determination of the Resync and Reference patterns .....		114
Annex K (normative) Specific Disk Information .....		116
Annex L (normative) Read Channel for measuring analog signals and jitter .....		132
Annex M (normative) Timing mean and timing jitter measuring procedure .....		133
Annex N (normative) Implementation Independent Mark Quality Determination (IIMQD) for the interchange of recorded media .....		134
Annex O (normative) Definition of the write pulse shape .....		136
Annex P (normative) Asymmetry measuring definition .....		137
Annex Q (normative) Enhanced Selective Inter-Symbol Interference Cancellation (ESISIC) algorithm .....		138
Annex R (normative) Requirements for interchange .....		140
Annex S (informative) Office environment .....		142
Annex T (informative) Derivation of the operating climatic environment .....		143
Annex U (informative) Transportation .....		148
Annex V (informative) Track deviation measurement .....		149
Annex W (informative) Measurement of the vertical birefringence of the cover layer .....		153
Annex X (informative) Quadrature Wobble offset control .....		154
Annex Y (informative) Start Position Shift (SPS) implementation .....		157
Annex Z (informative) Sector retirement guidelines .....		158

<b>Annex AA (informative) Guidelines for the use of Type WORM ODCs .....</b>	<b>159</b>
<b>Annex BB (informative) Media type identification in existing and future standards .....</b>	<b>160</b>
<b>Annex CC (informative) Laser power calibration for evaluation of media power parameters .....</b>	<b>161</b>