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1. Scope

This document is applicable to 120mm BD Re-writable disc which product no. is described on the cover page of this document. Unless otherwise specified in this document, the products conform to the "System Description Blu-ray Disc Rewritable Format Part1 Basic Format Specifications Version 2.11".

2. General parameters

User data capacity	: 25 Gbytes
Wavelength of laser diode	: 405 nm
Numerical aperture of objective lens	: 0.85
Track pitch	: 0.32 μm
Disc diameter	: 120 mm
Disk thickness	: 1.2 mm
Data area inner radius	: 24 mm
Data area outer radius	: 58 mm

3. Environmental conditions
 - 3.1 Operating environment

Temperature	: 5 to 55 $^{\circ}\text{C}$
Relative humidity	: 3 to 90 %
Absolute humidity	: 0.5 to 30 g/m^3

 - 3.2 Storage environment

Temperature	: -10 to 55 $^{\circ}\text{C}$
Relative humidity	: 5 to 90 %
Absolute humidity	: 1 to 30 g/m^3
Atmospheric pressure	: 60 to 106 kPa
Temperature variation	: 15 $^{\circ}\text{C}/\text{h}$ max.
Relative humidity variation	: 10 %/h max.

4. Measuring conditions
 - 4.1 Environmental conditions

Ambient temperature	: 23 ± 2 $^{\circ}\text{C}$
Relative humidity	: 45 to 55 %
Atmospheric pressure	: 86 to 106 kPa

 - 4.2 Pick Up Head

Wavelength	: 405 ± 5 nm
Polarization	: circularly polarized light
Numerical aperture	: 0.85 ± 0.01

 - 4.3 Measuring scanning velocity

	: 4.92 m/s (1x-speed)
	: 9.83 m/s (2x-speed)

5. Read and recording conditions
 - 5.1 Read conditions
 - a. Power of the read spot : 0.3 mW typical
 - 5.2 Recording conditions
 - a. Recording position : on groove
 - b. Optimum recording power (P_{wo}) & optimum erasing power (P_{eo}) : determined by OPC & Disc Information
 - c. Optimum recording power range : $3.0 \leq P_{wo} \leq 6.0$ mW (1x-speed)
: $3.0 \leq P_{wo} \leq 7.0$ mW (2x-speed)
 - d. Optimum erasing power range : $0.3 \leq P_{eo} \leq 4.6$ mW (1x-speed)
: $0.3 \leq P_{eo} \leq 5.4$ mW (2x-speed)
 - e. Bias Power : $0.1 \leq P_{bwo} \leq 4.0$ mW (1x-speed)
: $0.1 \leq P_{bwo} \leq 7.0$ mW (2x-speed)
6. Mechanical parameters
 - 6.1 Outer diameter and run-out of outer edge
 - Outer diameter : 120.0 ± 0.3 mm
 - Run-out of outer edge : 0.30 mm p-p max.
 - 6.2 Center hole
 - Center hole diameter : $15.00 +0.10/-0.00$ mm
 - Edge shape : no burr on the edge of the center hole
at the read-out side
 - 6.3 Maximum thickness of the disc : 1.40 mm
 - 6.4 Mass of the disc
 - Mass of the disc : 12 to 17 g
 - Moment of inertia : 0.032 g·m² max.
 - Dynamic imbalance : 2.5 g·mm max.
 - 6.5 Clamping area
 - Inner diameter of the clamping area : 23.0 mm max.
 - Outer diameter of the clamping area : 33.0 mm min.
 - Thickness of the disc within the clamping area : $1.20 +0.10/-0.05$ mm
 - 6.6 Information area
 - Starting diameter of the PIC : 44.0 to 44.4 mm
 - Starting diameter of the data area : $48.0 +0.0/-0.2$ mm
 - Maximum outer diameter of the data area : $116.0 +0.2/-0.0$ mm
 - 6.7 Axial run-out
 - a. The distance between each Recording Layer and the reference plane at a scanning velocity 4.917m/s over the entire disc : ± 0.30 mm max.
within one revolution : ± 0.10 mm max.
 - b. The residual axial tracking error below 1.6kHz measured using the reference servo. : 45 nm max.
 - c. The axial r.m.s. noise between 1.6kHz to 10 kHz measured using the reference servo. : 32 nm max.
 - 6.8 Radial run-out
 - a. The radial run-out of the tracks at a scanning velocity 4.917m/s : 75 μ m p-p max.
 - b. The residual radial tracking error below 1.8kHz measured using the reference servo. : 9 nm max.

- c. The radial r.m.s. noise between 1.8kHz to 10 kHz measured using the reference servo.
: 6.4 nm max.
7. Optical parameters
- 7.1 Thickness of the Cover Layer
reference thickness : 95 to 105 μm (refractive index = 1.6)
maximum deviation of the thickness from the reference : $\pm 2 \mu\text{m}$ max.
- 7.2 Refractive index of the Cover Layer : 1.45 to 1.70
- 7.3 Limits for the angular deviation of the reflected beam
- a. Radial deviation : $\pm 0.60^\circ$ max.
b. Tangential deviation : $\pm 0.30^\circ$ max.
- 7.4 Reflectivity of the recorded disc : 11 to 24 %
- 7.5 Polarity of modulation : high to low
8. Track geometry
- 8.1 Direction of the disc rotation as seen from the read-out side : counter-clockwise
- 8.2 Track pitch
- a. Average track pitch
in the embossed HFM disc area: : $0.350 \pm 0.003 \mu\text{m}$
in the Recordable disc area: : $0.320 \pm 0.003 \mu\text{m}$
- b. Maximum deviation of track pitch
in the embossed HFM disc area: : $0.350 \pm 0.010 \mu\text{m}$
in the Recordable disc area: : $0.320 \pm 0.010 \mu\text{m}$
- 8.3 Location of the BCA : between 21.3 -0.3/+0.0 mm and 22.0 -0.0/+0.2 mm
9. Operational signals
- 9.1 High Frequency signal (recorded disc)
- a. Jitter
multi-track writing : less than 7.0 %
cross-erase writing : less than 7.0 %
- b. Modulated amplitude
I8PP / I8H : 0.40 min.
I3PP / I8H : 0.25 min.
I8PP / I8H max
within one disc : 0.33 max.
within one revolution : 0.15 max.
- c. Signal asymmetry
 $[(I8H + I8L) - (I2H + I2L)]/2(I8H - I8L)$: -0.10 to 0.15
- 9.2 Servo signal
- 9.2.1 HFM Area
- a. Push Pull Signal : 0.26 to 0.52
- 9.2.2 Data Area
- a. Push Pull Signal : 0.21 to 0.45
b. Push Pull variation
within 150trk : 0.15 max
within one layer : 0.25 max
c. Push Pull Ratio : 0.75 to 1.25

9.3	Wobble signals	
9.3.1	HFM Area	
	a. NHWSmin	: 0.30 to 0.60
	b. NHWSmax / NHWSmin	: 3.0 max
	c. HFM Jitter	: 4.5% max
9.3.2	Data Area	
	a. NWS	: 0.20 to 0.55
	b. NWSmax / NWSmin	: 3.0 max
	c. Wobble CNR	: $\geq 26\text{dB}$
9.4	Symbol Error Rate	
	Random Symbol Error Rate	: $\leq 2.0\text{e-}4$
9.5	BCA signal	
	a) IH/IS	: 4.0 min.
	b) Distance between the leading edge of nT	: $n*5.8 \pm 1.3 \text{ us}$
	c) Distance between the trailing edge of nT	: $n*5.8 \pm 1.3 \text{ us}$
	d) Pulse width	: $2.5 \pm 1.1 \text{ us}$
10.	Reliability	
10.1	Read stability	: > 1,000,000 times (Pr 0.3 mW at 25 °C)
10.2	Overwrite durability	: > 1,000 times (Po at 25 °C)