



Meeting the BD Specification

A look at the BD Testing Center
for BD-ROM Media

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About the BD Test Centers

An overview of the BD Test Centers

- Before a licensed manufacturer can produce and sell BD-products, the products have to be approved by an official BDTC (BD Test Center)
- The BDTC is a testing authority that performs "First Production Model Inspection" on behalf of the Blu-ray Disc Association (BDA)
 - ▶ "Next Production Model" is internal testing done by the applicant (intended for product updates)
- Each BDTC can verify different Product Categories

The BD-ROM Product category

BD-ROM Media

Product Category in FLLA

Test Specification

BD-ROM (Hybrid) Movie Media	<p><i>BD-ROM Media (BD-Video, BD-Live and BD-ROM Disc)</i></p> <p><i>Latest version is 1.05 from August 2008</i></p>
BD-ROM (Hybrid) Non Movie Media	
BD-ROM (Hybrid) Non Commercial Audiovisual Media	
BD-ROM Data Media	
BD-ROM Game Media	
BD-ROM Commercial Audiovisual Content	<i>BD-ROM Media Commercial Audiovisual Content</i>
BD-ROM PC Drive	<i>BD-ROM Drive</i>
BD-ROM Movie Player	<i>BD-ROM Movie Player (BD-Video and BD-Live Player)</i>
BD-ROM Game Console	
BD-ROM PC Application Software	<i>BD-ROM PC Application (BD-Video and BD-Live Software)</i>

Test Centers for BD-ROM Media (1/2)

- BD-ROM Media: Check both compliance of disc to corresponding specification and to check the manufacturing- and measurement abilities of the applicant (replicator)
- The official BDTC's for BD-ROM Media are:
 - ▶ Almedio (Japan)
 - ▶ AudioDev (Sweden)
 - ▶ JVC (Japan)
 - ▶ Pioneer (Japan)
 - ▶ Sony (Japan)
- The BDTC's are not region-specific

Test Centers for BD-ROM Media (2/2)

- All BDTC's are acting separately, but coordinated through the VSG (Verification Service Group) within the BDA
- The VSG handles the Testing Center activities
 - ▶ VSG ensures the alignment between the different BD testing centers
 - ▶ All BDTC's need to be of BDA member level "Contributor" (or part of the Board of Directors)
- Prices for the verification services are set individually by each BDTC

Acquiring a Certificate

Requirements for BD-ROM Media certificate

- Applicant needs to fulfill some basic requirements:
 - ▶ Signed BD FLLA
 - ▶ Replication capabilities
 - ▶ A copy of the Test Specification
 - ▶ Measurement instruments for “self-test”



Example of certification process

Applicant



- ✓ Download the Test Specification
- ✓ Select a BD Testing Center
- ✓ Perform “self-test” according to Test Specification
- ✓ Send “self-test” results and samples to the selected BDTC

BDTC



- ✓ Inform BD License Office
- ✓ Measure samples according to Test Specification
- ✓ Finalize report to applicant
- ✓ Inform BD License Office about the verification results

BDA



- ✓ Issues the Certificate (once all items PASS)

Three main documents

- **Preliminary Information form** for BD-ROM Disc Verification (from BDTC to BDA)
 - ▶ The Applicants declaration of intent
- **Test Information form** of the verification for BD-ROM Disc (from Applicant to BDTC)
 - ▶ Detailed information about the supplied samples
- **Verification form** of 120mm SL/DL BD-ROM disc (from Applicant to BDTC)
 - ▶ Results from “self-test” (no print-outs)

All documents needed are included in the Test Specification

The “self-test”



Overview of the “self-test”

- The “self-test” is the applicants’ own test procedure on the disc/discs submitted to the BDTC
- All test items must be inside the specification limits (or “OK”)
- More test items for applicant than BDTC
- Measurement results from the “self-test” will be compared with the results from the BDTC

The Test Specification (1/2)

- The Test Specification consists of eight sections
- Part 1/8: Mechanical characteristics
 - ▶ Mass, dimensions, axial run-out/flatness, servo errors, start-/stop radius etc.
- Part 2/8: Optical characteristics
 - ▶ Thickness of the Transmission Stack, tilt, birefringence, reflectivity etc.
- Part 3/8: Track geometry
 - ▶ Track pitch (WP/NP), Connection area etc.

The Test Specification (2/2)

- Part 4/8: Recorded layer characteristics
 - ▶ HF-measurements (Asymmetry, Modulation, Resolution etc), Jitter, Track cross Signal, Digital error rates
- Part 5/8: BCA characteristics
 - ▶ Start-/stop radius, BCA-signals etc.
- Part 6/8: Other characteristics
 - ▶ Scratch test using Taber Abrasion (Jitter)
- Part 7/8 and 8/8: Sector contents
 - ▶ PIC-, BCA- and INFO/PAC

Useful tips (1/2)

- Make sure to be well inside the specification limits
- The test items for the applicant and BDTC are similar, but not the same (less for BDTC)
- The test items for BD25 and BD50 are not exactly the same
- BCA is optional (make sure to set the BCA-flag bit according to the disc)

Useful tips (2/2)

- Samples must have AACCS and ROM-mark (if applicable)
- Verify that the measurement equipments are properly calibrated
- Make sure to read the Test Specification thoroughly

Contact information

Two sources of information

- BDA License Office: <http://www.blu-raydisc.info/>
 - ▶ General information and news regarding licensing
 - ▶ Contact information for the BDTC's
 - ▶ Test Specifications as PDF's
- BDA Site: <http://www.blu-raydisc.com/en.html>
 - ▶ Information about the BDA (structure, memberships etc)
 - ▶ Technical White Papers and FAQ's
 - ▶ Press releases

Thank you for your attention!

