



# **DVD-Audio Disc**

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## **TEST SPECIFICATION**

**Version 1.3**  
**September 2007**

## Amendment for DVD-Audio Disc TS Version 1.3 (September 2007)

The following pages were amended without changing the version number of the TS.

- **Amendment 1 (March 19, 2009)**

Page	Location	Amendment
Pages 8 to 9	<b>Annex A</b>	<ul style="list-style-type: none"><li>• "Cinram Manufacturing" was deleted from the Class-A Lab list.</li><li>• Class-A Lab information of "Matsushita Electric Industrial Co., Ltd. (company name)", "Sony Corporation", "Victor Company of Japan, Limited" and "Industrial Technology Research Institute" was updated.</li></ul>
Page 12	<b>Annex D</b>	<ul style="list-style-type: none"><li>• The company name "Matsushita Electric Industrial Co., Ltd." was changed to "Panasonic Corporation".</li></ul>

- **Minor amendment (January 2010)**

Page	Location	Amendment
Pages 8 to 9	<b>Annex A</b>	<ul style="list-style-type: none"><li>• Class-A Lab information of "Panasonic Corporation", "PIONEER CORPORATION", "Victor Company of Japan, Limited" and "SAMSUNG ELECTRONICS CO., LTD" were updated.</li></ul>
Page 12	<b>Annex D</b>	<ul style="list-style-type: none"><li>• Class-A Lab information of "Panasonic Corporation" was updated.</li></ul>

- **Amendment 2 (January 2012)**

Page	Location	Amendment
Page 8	<b>Annex A</b>	<ul style="list-style-type: none"><li>• "Toshiba Corporation" was deleted from the Class-A Lab list.</li><li>• The company name "Victor Company of Japan, Limited" was changed to "JVC KENWOOD Corporation".</li></ul>
Page 12	<b>Annex D</b>	<ul style="list-style-type: none"><li>• DVD File System Verifier (TFSV02 V1.01) from Toshiba was discontinued.</li></ul>

- **Amendment 3 (June 2012)**

Page	Location	Amendment
Pages 8 to 9	<b>Annex A</b>	<ul style="list-style-type: none"><li>• "Industrial Technology Research Institute" was deleted from the Class-A Lab list.</li><li>• Class-A Lab information of "Sony Corporation", "LG Electronics Inc." and "SAMSUNG ELECTRONICS CO., LTD" were updated.</li></ul>

## Conditions for Publication

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## **Revision History**

- May 17, 1999  
DVD Audio Disc Test Specification Version 0.2 was distributed to Verification Task Force members.
- September 21, 1999  
DVD Audio Disc Test Specification Version 1.0 was authorized by Verification Task Force members.
- November 14, 2000  
DVD Audio Disc Test Specification Version 1.1 was authorized by Verification Task Force members.
- February 23, 2001  
Three Class-A Labs were added in Annex A.
- June 2005  
Version 1.11 updated Class-A Lab List and was edited as electronic files.
- September 20, 2005  
Version up to 1.2, to incorporate update of DVD-ROM Part 1: Physical Specifications (a.o. adding 3 layer types for SL Disc) including some minor textual changes, was approved by VTF.  
(The Version 1.2 was issued in October 2005.)
- September 21, 2007  
Version 1.3 was approved by TSTF. The Version 1.3 added the test item for the Physical format information (Book type).

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## Forms for DVD Format verification

### Form 1H

Preliminary Information for DVD Format Verification ..... F1

### Form 2H

Test Information of DVD Format Verification (1) ..... F2

### Form 3H

Test Information of DVD Format Verification (2) ..... F3

### Form 4H

Test results of the Mechanical parameters ..... F4

### Form 5H

Test results of the Optical parameters ..... F5

### Form 6H

Test results of the Recorded parameters ..... F6

### Form 7H

Test results of the Operational signals (1), (2) ..... F7

### Form 8H

Test result of the Physical format information ..... F9

### Form 9H

List of the Test results ..... F10

### Form 10H

Confirmation of DVD Format Verification ..... F11

## **1. General**

### **1.1 Scope**

The scope of this Test Specification is for the purpose of testing DVD-Audio Discs for compliance with **DVD Specifications for Read-Only Disc Part 1, 2 and 4**. The test procedure described herein could be used by Class-A Verification Labs, Class-B Verification Labs and Quality Assurance Departments of DVD-Audio Disc Licensees.

The scope of this Test Specification is limited to the product's compliance to DVD Specifications and not to evaluate performance of products.

### **1.2 Normative References**

DVD Specifications for Read-Only Disc

Part 1: Physical Specifications Version 1.0

Part 2: File System Specifications Version 1.0

Part 4: Audio Specifications Version 1.2

### **1.3 Scope of Products Covered**

DVD-Audio Disc

## 2. DVD Logo

DVD Format/Logo Licensing Corporation owns the rights to license the DVD Logo. To be able to use the DVD Logo, the DVD manufacturer must have:

- a. License to use the Logo and
- b. DVD Specification compliance of the product for logo consideration must be validated by the test specifications as defined in this document.

Licensing terms for the DVD Logo are available from the DVD Format/Logo Licensing Corporation.

This chapter describes the mechanism to be used for product compliance testing.

### 2.1 Definition of Terms Used

**First Production Model-** The **First Production Model** must be tested and approved by any of the appropriate Class-A Verification Labs (see definition of Class-A Labs below) for compliance with DVD Specifications. Class-A Labs will use the test specifications described in this document for compliance verification.

The following parameters must be used to determine a **First Production Model**:

- DVD Specifications Version n.x changing to n+1.x.
- Production of a new DVD disc type by the licensee. A Single Layer disc and a Dual Layer disc are defined as disc types for First Production Model.
- Initial or the latest production model at the start of Logo Program for each licensee

**Next Production Model-** A **Next Production Model** does not require compliance verification from a Class-A verification lab, but must be tested by licensee in its QA department for compliance with DVD Specifications. Licensee's QA department must have the test tools required to perform the tests specified in this document and must, at minimum, use the test procedure referred to in this document (licensee is free to have its own QA procedure, equipment and tools as long as it is a superset of the specification described in this document). A Licensee without its own QA department can get the product tested by a certified Third Party Class-B Verification Lab (see definition of Class-B Labs below).

The following parameters must be used to determine a **Next Production Model**:

- DVD Specifications Version n.x changing to n.x+1.
- Production of a double sided disc.
- Production of a double side multilayer disc (3 or 4 layers in total on two sides).
- Production of a different size of disc. e.g. 8 and 12 cm
- Production of a different type of Single Layer disc. e.g. Low Density type, Thin type, Thin Low Density type
- Significant changes in the tools and/or the process of authoring, encoding or other processes related to the manufacturing of DVD-Audio Discs.



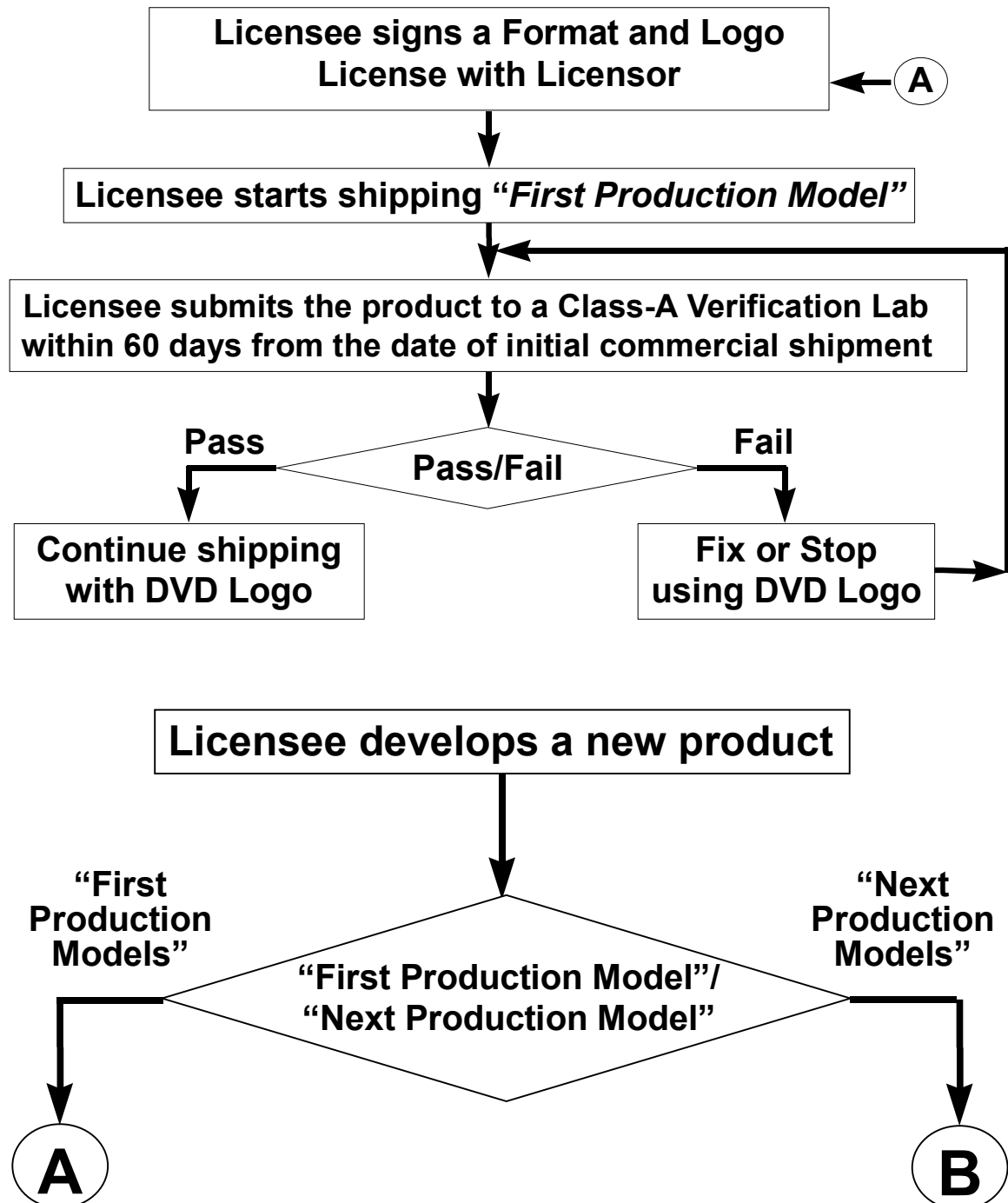
***Class-A Verification Labs-*** Class-A verification Labs are experts in DVD technology and provide independent expert assessment of Licensee's product compliance with respect to DVD Specifications. Class-A Labs also provide additional services such as interpretation of DVD Specifications, Test Tool development, Class-B Lab and licensee auditing, etc.

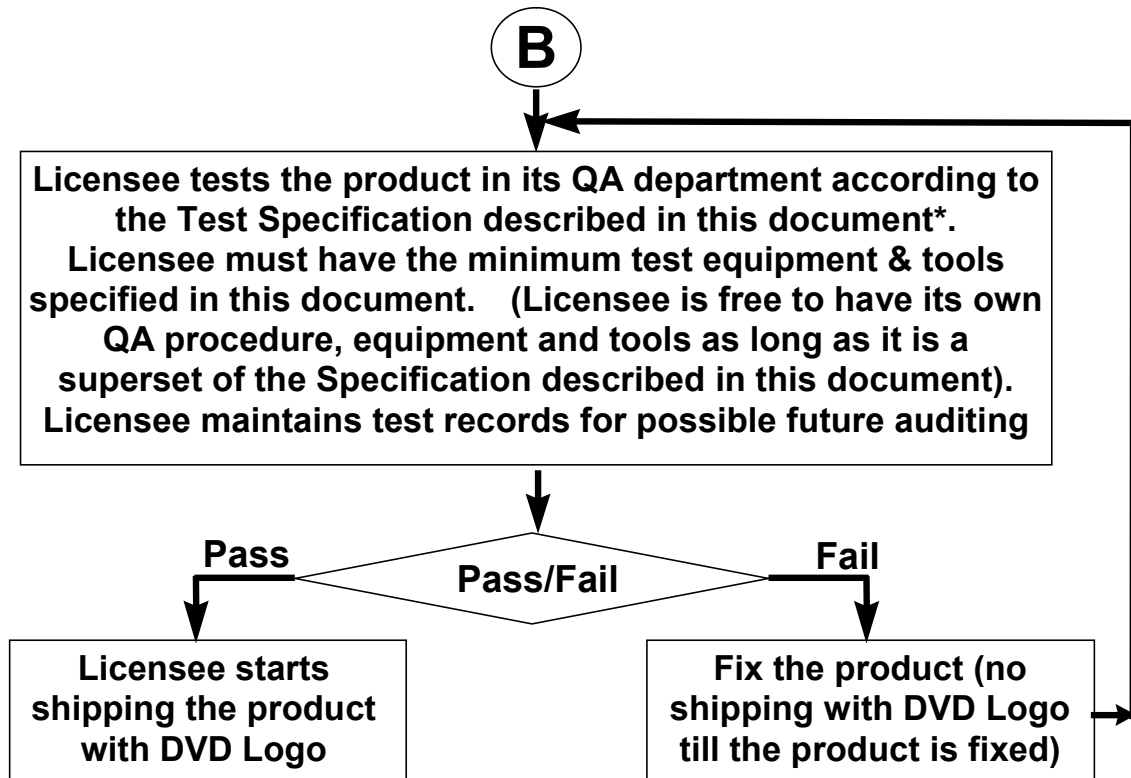
***Class-B Verification Labs-*** DVD-Audio Disc Class-B Verification Labs provide DVD-Audio Disc testing strictly according to the **DVD-Audio Disc Test Specification** as described in this document (They can not interpret the specifications).

It is possible that a Class-B Lab only performs the logical verification services or only the physical verification services.

## 2.2 DVD Logo Mechanism

The DVD Logo mechanism is described in the following flow chart:





\*: Licensee without own QA department can get the product tested by a **DVD-Audio Disc Class-B Verification Lab**.

### 3. Test Tools and Test Specifications

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing.

#### 3.1 Test Tools

The following test tools are required to perform the tests specified and shall be available before executing the test procedures.

##### 3.1.1 Physical

Physical test tools are to be equipped by each Lab and applicant individually.

The tools shall be adequate to perform the test of the parameters defined in the **Annex E** Physical Test Parameters.

##### 3.1.2 Logical

To be able to check the DVD-Audio Discs a Verifier for Application Layer and a Verifier for File System are needed. As for acquisition of Recommended Verifiers, refer to **Annex D**.

Recommended Verifier for Application Layer is:

- DVD-Audio/Video Verifier (DVD-AV01)

Recommended Verifier for File System is:

- DVD-Audio/Video File System Verifier (DVD-FV10AV) or
- DVD File System Verifier (TFSV02 V1.01)

#### 3.2 Test Specifications

The following sections describe the requirements and test procedures required for verification for DVD-Audio Disc products. The tests are identical for both, the First Production Models and the Next Production Models.

##### 3.2.1 Physical

The DVD Audio Disc shall be in compliance with the Physical DVD requirements as indicated in DVD Specifications for Read-Only Disc Part 1. This shall be confirmed by measuring the parameters, as mentioned in **Annex E** Physical Test Parameters.

The test results shall be described in **Form 4H to 9H**.

The applicant is requested to submit the test samples with the test results after obtaining the data of the parameters O, A, and \*(asterisk), as indicated in **Annex E**, which may be obtained by self-test or the test conducted by a Class-B Lab.

### **3.2.2 Logical**

The DVD-Audio Disc shall be in compliance with the Logical DVD requirements as indicated in the DVD Specifications for Read-Only Disc, Part 2 and Part 4.

The test results and the verifiers used shall be described in **Form 9H**.

The applicant is requested to submit the test results by verifiers together with the test samples, which may be evaluated by self-test or at a Class-B Lab.

### **3.3 Other requirements**

The applicant is requested to report to the Class-A Lab how to identify all the manufacturers (the licensees) of DVD-Audio Discs.

e.g. Manufacturer unique identifier on the clamping area, etc.

## Annex A

### List of Class-A Verification Labs

*This List is correct at the time of publication. However, when the Class-A Lab information contained here differs from such information cited in our website [www.dvdfllc.co.jp](http://www.dvdfllc.co.jp), the List with more current date prevails. Also, please refer to the website for the latest Verification Service of each Class-A Lab.*

#### Japan

##### **JVC KENWOOD Corporation**

DVD Verification Lab.

12, 3-chome, Moriya-cho, Kanagawa-ku, Yokohama, Kanagawa, 221-8528 Japan

Fax: +81-45-450-2425

##### **Panasonic Corporation**

Format Verification Laboratory

1-15, Matsuo-cho, Kadoma, Osaka, 571-8504 Japan

Fax: +81-6-6909-5027

E-mail: [fvl-info@ml.jp.panasonic.com](mailto:fvl-info@ml.jp.panasonic.com) URL: <http://panasonic.co.jp/avc/fvl/en/index.html>

##### **PIONEER CORPORATION**

Verification Laboratory

1-1 Shin-ogura, Saiwai-ku, Kawasaki-shi, Kanagawa, 212-0031 Japan

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Fax: +81-50-3750-6608

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**Korea**

**LG Electronics Inc.**

DVD Verification Laboratory

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E-mail: kyoungtai.koo@lge.com

**SAMSUNG ELECTRONICS CO., LTD**

DVD Verification Laboratory

VD Division, DM Business

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Tel: +82-31-277-0875 Fax: +82-31-277-3398

E-mail: bd.tcenter@samsung.com

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**Panasonic Disc Manufacturing Corporation of America**

PDMC Verification Laboratory

20608 Madrona Avenue, Torrance, CA 90503 U.S.A.

Fax: +1-310-783-4849

## Annex B

### Glossary of Terms Used

Standard type	: A DVD-ROM Single Layer disc with standard substrate and standard density, defined in Part 1 (see <b>1.2 Normative Reference</b> )
Low Density type*	: A DVD-ROM Single Layer disc with standard substrate and low density, defined in Part 1 (see <b>1.2 Normative Reference</b> )
Thin type*	: A DVD-ROM Single Layer disc with thin substrate and standard density, defined in Part 1 (see <b>1.2 Normative Reference</b> )
Thin Low Density type*	: A DVD-ROM Single Layer disc with thin substrate and low density, defined in Part 1 (see <b>1.2 Normative Reference</b> )
Standard Density	: denotes Standard type or Thin type of a Single Layer disc
Low Density	: denotes Low density type or Thin Low Density type of a Single Layer disc, or a Dual Layer disc

\* : These three types were introduced in "Supplemental Information for Part 1 (May 2004)".



## Annex C

### Procedure for Class-A Verification Lab Product Submission

The procedure for submitting a product to a Class-A Verification Lab is as follows:

#### **Preliminary Application**

Applicant must complete **Form 1H** to provide preliminary information.

#### **Self Test**

Applicant must test the product in accordance with this Test Specification prior to submitting samples to a Class-A Verification Lab. Applicant must complete **Form 2H to 9H** to provide test results.

#### **Mutual Non-Disclosure Agreement (NDA)**

Applicant, in order to maintain the confidentiality of the applicant product and Verification Lab's information, must sign a Mutual Non-Disclosure Agreement.

#### **Application**

Applicant must submit **10 product samples** along with **Form 2H to 9H** and the NDA.

#### **Test Result**

Upon completion of testing, Verification Lab will complete **Form 10H** to inform the applicant and DVD Format/Logo Licensing Corporation of the test results.

## Annex D

### Test Tool Contact Information

*The Contact Information is correct at the time of publication. However, when the Class-A Lab information (marked <\*>) differs from such information cited in our website [www.dvdfllc.co.jp](http://www.dvdfllc.co.jp), the List with more current date prevails.*

**DVD-Audio/Video Verifier (DVD-AV01)** and **DVD-Audio/Video File System Verifier (DVD-FV10AV)** shall be delivered by:

**Panasonic Corporation<\*>**

Format Verification Laboratory

1-15, Matsuo-cho, Kadoma, Osaka, 571-8504 Japan

Fax: +81-6-6909-5027

E-mail: [fv1-info@ml.jp.panasonic.com](mailto:fv1-info@ml.jp.panasonic.com) URL: <http://panasonic.co.jp/avc/fv1/en/index.html>

**DVD File System Verifier (TFVS02 V1.01):**

*Discontinued*

## Annex E

## Physical Test Parameters

Parameter	Abbreviation	See Legend	Spec. number <sup>1)</sup>
<b>Mechanical parameters</b>			
Outer diameter	D1	*	2.4.2
Center hole diameter 1 side	D2	*	2.4.4
Center hole diameter both sides	CHD	O	2.4.5
Edge shape	Edge	*	2.4.6
Thickness of disc	L1	O	2.4.7
Thickness in clamping area	L2	O	2.4.11
Mass of disc	M	*	2.4.12
Moment of Inertia	I	*	2.4.13
Dynamic Imbalance	U	O	2.4.14
<b>Optical parameters</b>			
Thickness of a transparent substrate	ST	O	2.5.1
Thickness of space layer	TSL	O	2.5.2
Variation of space layer : disc	TSL-D <sub>var</sub>	O	2.5.3 a
Variation of space layer : circle	TSL-R <sub>var</sub>	O	2.5.3 b
Refractive index substrate	RI <sub>sub</sub>	*	2.5.4 a
Refractive index space layer	RI <sub>space</sub>	*	2.5.4 b
Angular deviation : radial	ADR	A	2.5.5 a
Angular deviation : tangential	ADT	A	2.5.5 b
Birefringence	Biref	O	2.5.6
Reflectivity Single Layer w PBS	R <sub>SL,PBS</sub>	O	2.5.7
Reflectivity Single Layer wo PBS	R <sub>SL,noPBS</sub>	±	2.5.7
Reflectivity Dual Layer w PBS	R <sub>DL,PBS</sub>	O	2.5.7
Reflectivity Dual Layer wo PBS	R <sub>DL,noPBS</sub>	±	2.5.7

Note 1): Refer to DVD Specifications for Read-Only Disc Part 1.

Parameter	Abbreviation	See Legend	Spec. number <sup>1)</sup>
<b>Recorded parameters</b>			
Sense of rotation from readout		*	2.6.1
LBR velocity variation		*	2.6.2
Starting diameter of Lead-in	SD <sub>LI</sub>	*	2.6.5
Starting diameter of Data area	SD <sub>DA</sub>	*	2.6.6
Outer diameter of Data area	OD <sub>DA</sub>	*	2.6.7
Inner diameter of Lead-out	ID <sub>LO</sub>	*	2.6.9
Outer diameter of Lead-out	OD <sub>LO</sub>	*	2.6.10
Max diff L0-L1 outer edge IA		*	2.6.12 a
Max.diff L0-L1 outer edge DA		*	2.6.12 b
Vertical deviation	VD	O	2.6.14 a
Max. focus error	FE	O	2.6.14 b
Radial run-out of tracks	RRO	O	2.6.15 a
Max. radial error	RE	O	2.6.15 b
Radial Noise		O	2.6.15 c
<b>Operational signals</b>			
Jitter		O	2.7.1 a
I <sub>14</sub> / I <sub>14H</sub>		O	2.7.1.b
I <sub>3</sub> / I <sub>14</sub>		O	2.7.1 b
(I <sub>14Hmax</sub> -I <sub>14Hmin</sub> ) / I <sub>14Hmax</sub> Within one disc (with PBS)		O	2.7.1 b
(I <sub>14Hmax</sub> -I <sub>14Hmin</sub> ) / I <sub>14Hmax</sub> Within one disc (without PBS)		±	2.7.1 b
(I <sub>14Hmax</sub> -I <sub>14Hmin</sub> ) / I <sub>14Hmax</sub> Within one revolution (with PBS)		O	2.7.1 b
(I <sub>14Hmax</sub> -I <sub>14Hmin</sub> ) / I <sub>14Hmax</sub> Within one revolution (without PBS)		±	2.7.1 b
Asymmetry	A	O	2.7.1 c
Track Cross	TCS	O	2.7.1 d
DPD Amplitude		O	2.7.2 a
DPD Asymmetry		O	2.7.2 a
PI errors		O	2.7.3 a
Defects		*	2.7.3 b
Total length defects or total number		*	2.7.3 b

Note 1): Refer to DVD Specifications for Read-Only Disc Part 1.

Parameter	Abbreviation	See Legend	Spec. number <sup>1)</sup>
<b>Physical format information</b>			
Book type		O	3.4.1.3.1

Note 1): Refer to DVD Specifications for Read-Only Disc Part 1.

**Legend:**

- O stands for : The applicant submits the measured value, and Class-A Lab conducts verification on the samples submitted.
- A stands for : The applicant submits the measured value, and Class-A Lab conducts verification on the samples submitted. However (often depending on the type of production process) the value might change (Aging) as a result of normal use/storage conditions. The value should remain within the specified parameter values during normal use. On the initiative of the Class-A Lab adequate use/storage simulation can be requested before measuring the samples.
- \* stands for : The applicant submits the data and Class-A Lab checks the data. In general these values can be checked indirectly or via a destructive process or are only available during the production process. A Class-A Lab will in general not measure these parameters.
- ± stands for : The applicant has to control this parameter in some way. Identified the required equipment and considered it to be not practical to require this measurement to be done. For Class-A Labs it is recommended to be able to check the values to be within the specification.

Note: The indications in the table are subject to changes in later versions of this document or depending on simple and effective measurement descriptions and/or the availability of cost effective measurement equipment.