



DVD-Video Disc

TEST SPECIFICATION

Version 1.3
February 2008

Amendment for DVD-Video Disc TS Version 1.3 (February 2008)

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

- **Amendment 1 (July 4, 2008)**

Page	Location	Amendment
Pages 8 to 10	Annex A	<ul style="list-style-type: none">• Verification services of "Cinram Manufacturing" and "Crest Digital" were updated from "DVD-Video Disc only" to "both DVD-Video Disc and Time Limited DVD-ROM Disc".• E-mail address was added to the contact information of "Victor Company of Japan, Limited".

- **Amendment 2 (October 1, 2008)**

Page	Location	Amendment
Pages 8 to 10	Annex A	<ul style="list-style-type: none">• "ALMEDIO INC." was added as a Class-A Lab for "both DVD-Video Disc and Time Limited DVD-ROM Disc".• The company name "Matsushita Electric Industrial Co., Ltd." was changed to "Panasonic Corporation".
Page 13	Annex D	<ul style="list-style-type: none">• The company name "Matsushita Electric Industrial Co., Ltd." was changed to "Panasonic Corporation".

- **Amendment 3 (December 4, 2008)**

Page	Location	Amendment
Pages 8 to 10	Annex A	<ul style="list-style-type: none">• "Dataplay GmbH" was added as a Class-A Lab for "both DVD-Video Disc and Time Limited DVD-ROM Disc".

- **Amendment 4 (February 13, 2009)**

Page	Location	Amendment
Pages 8 to 9	Annex A	<ul style="list-style-type: none">• "Royal Philips Electronics" was deleted from the Class-A Lab list.• Class-A Lab information of "Industrial Technology Research Institute" was updated.
Page 13	Annex D	<ul style="list-style-type: none">• The Lab mark <*> was deleted from "Royal Philips Electronics".

- **Amendment 5 (March 19, 2009)**

Page	Location	Amendment
Page 9	Annex A	<ul style="list-style-type: none">• "Cinram Manufacturing" was deleted from the Class-A Lab list.

- **Minor Amendment (January 2010)**

Page	Location	Amendment
Pages 8 to 10	Annex A	<ul style="list-style-type: none">• Class-A Lab information of "Victor Company of Japan, Limited", "SAMSUNG ELECTRONICS CO., LTD", "Panasonic Corporation" and "PIONEER CORPORATION" were updated.
Page 13	Annex D	<ul style="list-style-type: none">• Class-A Lab information of "Panasonic Corporation" was updated.

- **Amendment 6 (January 2012)**

Page	Location	Amendment
Pages 8 to 9	Annex A	<ul style="list-style-type: none"> • "Crest Digital" and "Toshiba Corporation" were deleted from the Class-A Lab list. • The company name "Victor Company of Japan, Limited" was changed to "JVC KENWOOD Corporation". • E-mail address was added to the information of ALMEDIO INC.
Page 13	Annex D	<ul style="list-style-type: none"> • DVD File System Verifier (TFSV02 V1.01) from Toshiba was discontinued.

- **Amendment 7 (June 2012)**

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

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- Panasonic Corporation (Osaka, Japan)
- Panasonic Disc Manufacturing Corporation of America (Torrance, USA)
- PIONEER CORPORATION (Tokyo, Japan)
- Sony Corporation (Tokyo, Japan)
- Time Warner Inc. (New York, U.S.A.)
- Toshiba Corporation (Tokyo, Japan)

Inquiry

For any further explanation of the contents of this document or in case of any perceived inconsistency or ambiguity of interpretation, please consult:

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Revision History

- June 18, 1999
First version draft was distributed to the Verification Task Force members.
- July 21, 1999
Version 1.0 was agreed by Verification Task Force members with some modifications.
- Sept 1, 1999
Version 1.0 was revised in accordance with Verification Task Force decision.
- May 2001
DVD Logo Mechanism for DVD-Video Products was changed to complete the verification before commercial shipment. According to the Logo Mechanism change, Test Tools change, the latest list of Class-A Labs and the latest Forms, DVD FLLC drafted the version 1.1.
- May 15, 2001
Verification Task Force members authorized the version 1.1.
- February 2002
Class-A Lab Crest National was added.
- April 2004
Lab names and addresses were updated and Form 1E was modified. (Ver. 1.12)
- June 2005
Version 1.13 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.)
- February 7, 2008
Update of "DVD-ROM Part 1: Physical Specifications – Optional Specifications Time Limited DVD-ROM, Revision 1.0" was incorporated. "Book type" was added as test parameter. Reflectivity and related measurements without PBS were deleted.
The Version 1.3 was approved by TSTF.

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Forms for DVD Format verification

Form 1E

Preliminary Information for DVD Format Verification F1

Form 2E

Test Information of DVD Format Verification (1) F2

Form 3E

Test Information of DVD Format Verification (2) F3

Form 4E

Test results of the Mechanical parameters F4

Form 5E

Test results of the Optical parameters F5

Form 6E

Test results of the Recorded parameters F6

Form 7E

Test results of the Operational signals F7

Form 8E

Additional test results only for Time Limited Disc F9

Form 9E

Test result of the Physical format information F10

Form 10E

List of the Test results F11

Form 11E

Confirmation of DVD Format Verification F12

1. General

1.1 Scope

The scope of this Test Specification is the testing DVD-Video Discs for compliance with **DVD Specifications for Read-Only Disc Part 1, 2 and 3**. The test procedure described herein could be used by Class-A Verification Labs, Class-B Verification Labs and Quality Assurance Departments of DVD-Video 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

Optional Specifications Time Limited DVD-ROM Revision 1.0

Part 2: File System Specifications Version 1.0

Part 3: Video Specifications Version 1.1

1.3 Scope of Products Covered

DVD-Video Disc (including Time Limited DVD-ROM 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:
 - Single Layer disc,
 - Dual Layer disc,
 - Time Limited DVD-ROM disc (only Dual Layer).
- 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
- Time Limited DVD-ROM Disc with different pre-determined time period
- Significant changes in the tools and/or the process of authoring, encoding or other processes related to the manufacturing of DVD-Video Discs.

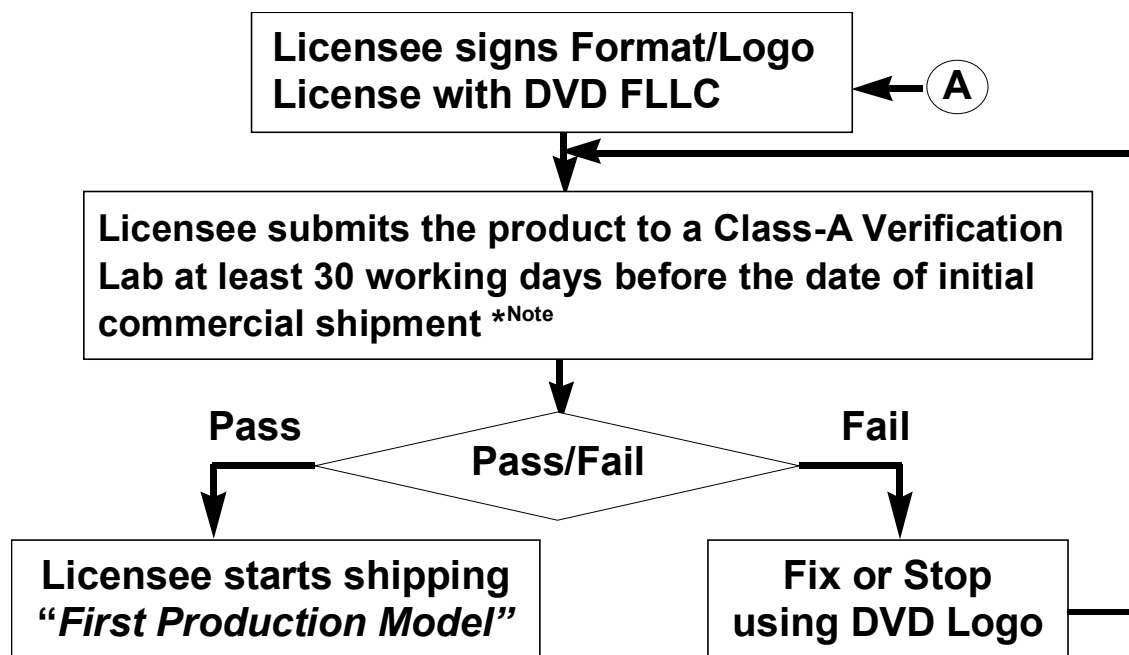
Class-A Verification Labs- Class-A verification Labs are experts in DVD technology and provide independent expert assessment of Licensee's product compliance with respect to DVD Specifications. Class-A Labs also provide additional services such as interpretation of DVD Specifications, Test Tool development,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

Class-B Verification Labs- DVD-Video Disc Class-B Verification Labs provide DVD-Video Disc testing strictly according to the DVD-Video 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

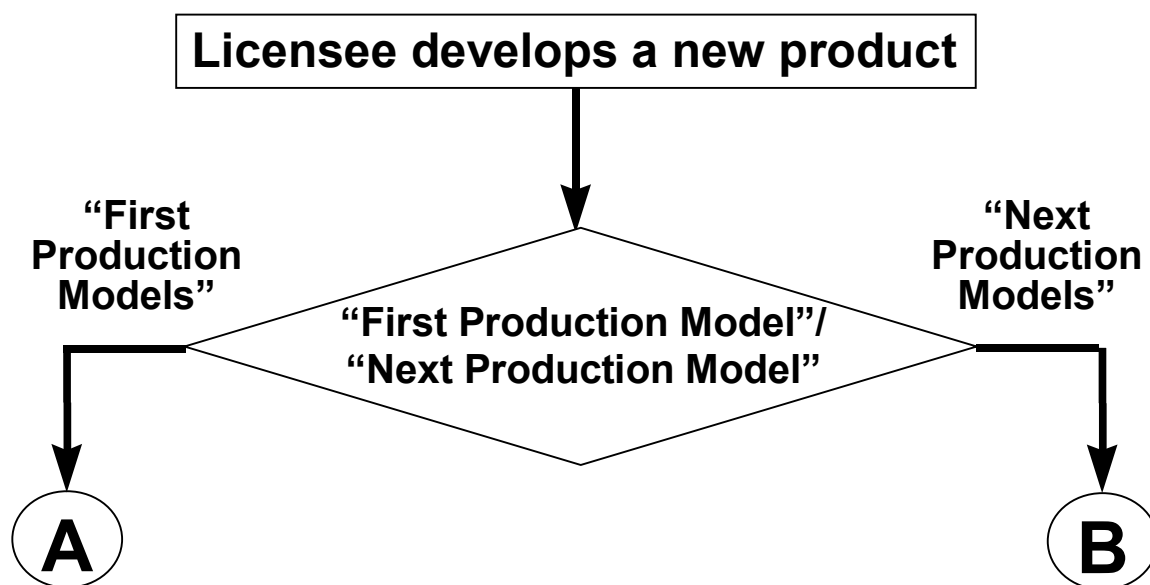
The DVD Logo mechanism for DVD-Video Products is described in the following flow chart:

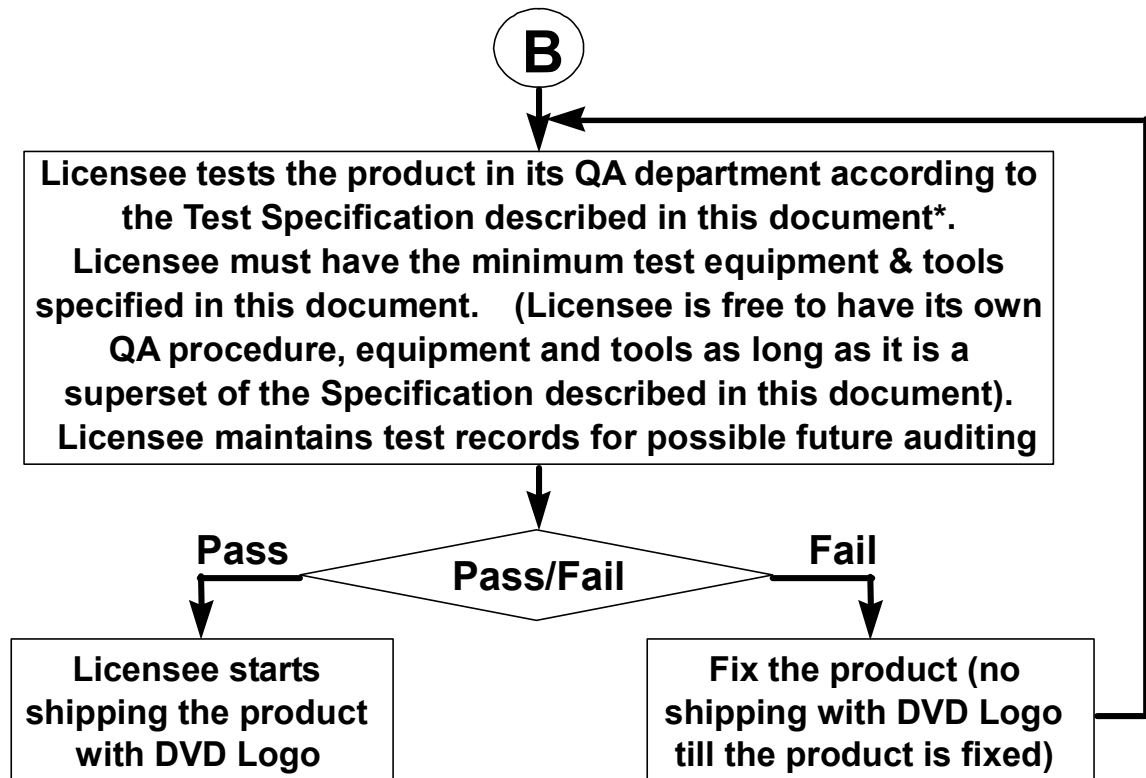


**Note: This rule is applied to the First Production Model of DVD-Video Products (DVD-Video Disc and DVD-Video Player) commercially shipped on or after October 1, 2001.*

To the First Production Model shipped before October 1, 2001, the rule of Test Specification version 1.0, in which Licensee submits the product samples within 60 days from the date of initial commercial shipment, is applied.

Note: In case of Time Limited DVD-ROM Disc, "Time Limited" Mark shall be displayed.





*: Licensee without own QA department can get the product tested by a **DVD-Video 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-Video Discs a Verifier for Application Layer and a Verifier for File System are needed. As for acquisition of Recommended Verifiers, refer to **Annex D**.

Verifier for Application Layer is:

- DVD-Audio/Video Verifier (DVD-AV02)

Verifiers for File System are:

- DVD-Audio/Video File System Verifier (DVD-FV20AV) or
- DVD File System Verifier (TFSV02 V1.01)

Verifier for Application Layer and File System is:

- DVD-Video Verifier (Philips Verifier)

3.2 Test Specifications

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

3.2.1 Physical

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

The test results shall be described in **Form 4E to 10E**.

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-Video Disc shall be in compliance with the Logical DVD requirements as indicated in the DVD Specifications for Read-Only Disc Part 2 and Part 3.

The test results and the verifiers used shall be described in **Form 10E**.

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-Video 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, the List with more current date prevails. Also, please refer to the website for the latest Verification Service of each Class-A Lab.

For both DVD-Video Disc and Time Limited DVD-ROM Disc:

Europe

DaTARIUS GmbH

DVD Verification Laboratory

Planseestr.4, A-6600 Reutte, Austria

Tel: +43-676-848391-0 Fax: +43-512-21992-11132

Email: a-lab@datarius.com <http://www.datarius.com>

Japan

ALMEDIO INC.

Testing Laboratory

32-13, Sakae-cho 2 chome, Higashimurayama-shi, Tokyo, 189-0013 Japan

Fax: +81-42-397-1919

E-mail: testlab@almedio.co.jp

JVC KENWOOD Corporation

DVD Verification Lab.

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

Fax: +81-45-450-2425

Sony Corporation

Verification Laboratory

2-10-1 Osaki, Shinagawa-ku, Tokyo, 141-8610 Japan

Fax: +81-50-3750-6608

(Continued)

Korea

LG Electronics Inc.

DVD Verification Laboratory

19-1 Cheongho-Ri, Jinwi-Myun, Pyungtaik-City, Kyunggi-Do, 451-713 Korea

Tel: +82-31-686-4838 Fax: +82-31-686-4827

E-mail: kyoungtai.koo@lge.com

SAMSUNG ELECTRONICS CO., LTD

DVD Verification Laboratory

VD Division, DM Business

416, Maetan-3Dong, Yeongtong-Gu, Suwon-City, Gyeonggi-Do, 443-742 Korea

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

E-mail: bd.tcenter@samsung.com

(Continued)

For DVD-Video Disc only:

Japan

Memory-Tech Corporation

DVD Verification Laboratory

2-27-25, Minami-Aoyama, Minato-ku, Tokyo, 107-0062 Japan

Tel: +81-3-3405-8925 Fax: +81-3-3405-7602

E-mail: verification-lab@memory-tech.co.jp URL: <http://www.memory-tech.co.jp>

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 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

Fax: +81-44-580-4027

U.S.A.

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 1.2 Normative Reference)
Low Density type* :	A DVD-ROM Single Layer disc with standard substrate and low density, defined in Part 1 (see 1.2 Normative Reference)
Thin type* :	A DVD-ROM Single Layer disc with thin substrate and standard density, defined in Part 1 (see 1.2 Normative Reference)
Thin Low Density type* :	A DVD-ROM Single Layer disc with thin substrate and low density, defined in Part 1 (see 1.2 Normative Reference)
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
Time Limited DVD-ROM** :	A DVD-ROM Dual Layer disc that maintains its data integrity for a pre-determined time period after the disc is removed from its protective package. Once opened, the time limited playback window begins and stops after the pre-determined time period.

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

** : This type was introduced in "Optional Specifications Time Limited DVD-ROM (Revision 1.0, November 2006)".

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 1E** 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 2E to 10E** 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 2E to 10E** and the NDA.

Test Result

Upon completion of testing, Verification Lab will complete **Form 11E** 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, the List with more current date prevails.*

DVD-Audio/Video Verifier (DVD-AV02) and **DVD-Audio/Video File System Verifier (DVD-FV20AV)** 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: fvl-info@ml.jp.panasonic.com URL: <http://panasonic.co.jp/avc/fvl/en/index.html>

DVD File System Verifier (TFSV02 V1.01):

Discontinued

DVD-Video Verifier (Philips Verifier) shall be delivered by:

Royal Philips Electronics

Philips Intellectual Property & Standards

Business Support

High Tech Campus 44, 5656 AE Eindhoven, The Netherlands

Fax: +31-40-2732113

E-mail: info.licensing@philips.com URL: <http://www.ip.philips.com/licensing>

Annex E

Physical Test Parameters

Parameter ¹⁾	Abbreviation	See Legend	Spec. number ¹⁾
Mechanical parameters			
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
Optical parameters			
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 _{var}	O	2.5.3 a
Variation of space layer : circle	TSL-R _{var}	O	2.5.3 b
Refractive Index substrate	RI _{sub}	*	2.5.4 a
Refractive Index space layer	RI _{space}	*	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 with PBS	R _{SL,PBS}	O	2.5.7
Reflectivity Dual Layer with PBS	R _{DL,PBS}	O	2.5.7

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

Parameter ¹⁾	Abbreviation	See Legend	Spec. number ¹⁾
Recorded parameters			
Sense of rotation from readout		*	2.6.1
LBR velocity variation		*	2.6.2
Starting diameter of Lead-in	SD _{LI}	*	2.6.5
Starting diameter of Data area	SD _{DA}	*	2.6.6
Outer diameter of Data area	OD _{DA}	*	2.6.7
Inner diameter of Lead-out	ID _{LO}	*	2.6.9
Outer diameter of Lead-out	OD _{LO}	*	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
Operational signals			
Jitter		O	2.7.1 a
I ₁₄ / I _{14H}		O	2.7.1.b
I ₃ / I ₁₄		O	2.7.1 b
(I _{14Hmax} –I _{14Hmin}) / I _{14Hmax} Within one disc (with PBS)		O	2.7.1 b
(I _{14Hmax} –I _{14Hmin}) / I _{14Hmax} Within one revolution (with PBS)		O	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
Physical format information			
Book type		O	3.4.1.3.1

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

Parameter ¹⁾	Abbreviation	See Legend	Spec. number ¹⁾
Additional test only for Time Limited DVD disc			
Reflectivity dual layer with PBS ^{**)}	R _{DL_PBS}	O	2.5.7
Jitter ^{**)}		O	2.7.1 a
PI errors ^{**)}		O	2.7.3 a
Expired Reflectivity ²⁾	R _{EX}	O	2.4.1 ²⁾

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

Note 2): Refer to "Optional Specifications Time Limited DVD-ROM".

Note ^{**)}: Shall be measured just before pre-determined time period has passed.

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.

Notes:

- 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.
- Due to the specific properties of the Time Limited DVD-ROM disc, it shall be measured as quickly as possible after removing it from its protective package. Refer to section 2.3.1 of Optional Specifications for the environmental conditions after removing from the protective package.
- Some parameters ^{**)} shall be re-measured just before the pre-determined time period applied in **Form 8E** has passed to check the data integrity.
- Expired reflectivity of Time Limited DVD-ROM disc must be checked in its saturated state (See **Form 8E**).