



DVD Multi Drive (Writable)

TEST SPECIFICATION

Version 1.1
September 2005

Amendment for DVD Multi Drive (Writable) TS Version 1.1 (September 2005)

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

- **Minor amendment (April 16, 2009)**

Page	Location	Amendment
Page 13	Annex A	<ul style="list-style-type: none">• Class-A Lab information of "Hitachi, Ltd.", "Industrial Technology Research Institute", "Matsushita Electric Industrial Co., Ltd. (company name)" and "Sony Corporation (addition)" was updated.

- **Minor amendment (January 2010)**

Page	Location	Amendment
Page 13	Annex A	<ul style="list-style-type: none">• Class-A Lab information of "Hitachi, Ltd. (company name)" and "Panasonic Corporation" were updated.

- **Amendment 1 (January 2012)**

Page	Location	Amendment
Page 13	Annex A	<ul style="list-style-type: none">• "Toshiba Corporation" was deleted from the Class-A Lab list.

- **Amendment 2 (June 2012)**

Page	Location	Amendment
Page 13	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 "Sony Corporation" was updated.

Conditions for Publication

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Revision History

- December 1999
Version 0.2 was distributed to VTF ad-hoc members for discussion.
- May 2000
Version 0.3 was drafted and distributed to VTF ad-hoc members for review.
- March 2001
Version 0.9 was drafted and distributed to VTF ad-hoc members.
- April 2001
Version 1.0 (Draft) was approved at VTF and VPC.
- July 2001
DVD Multi Drive (Writable) Test Specification Version 1.0 was revised on the basis of the DVD Multi Specifications Version 1.0.
- September 13, 2001
Steering Committee approved DVD Multi Drive (Writable) Test Specification Version 1.0.
- August 31, 2005
Version up to 1.1, to incorporate updates of the related DVD Specifications and Test Specifications, was approved by VTF.
(The Version 1.1 was issued in September 2005.)

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Forms for DVD Format verification

Form 1BB

Preliminary Information for DVD Format Verification F1

Form 2BB

Test Information of DVD Format Verification F2

Form 3BB

Confirmation of DVD Format Verification F3

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1. General

1.1 Scope

The scope of this Test Specification is to test DVD Multi Drive (Writable) for compliance with the minimum requirements of DVD Multi Specifications: PRODUCT REQUIREMENTS Version 1.1.

Class-A Verification Labs, Class-B Verification Labs and Quality Assurance Departments of DVD Multi Drive (Writable) manufacturers could use the test procedure described herein.

The scope of this Test Specification is limited to product compliance to DVD Multi product requirements and not to evaluate performance or their product quality.

Note: This product is regarded as an associated product conforming to the plural DVD Specifications (i.e. DVD-ROM, DVD-R for General, DVD-RW and DVD-RAM Book). Therefore this Test Specification involves four kinds of test group which may link to the verification fee.

1.2 Scope of Products Covered

DVD Multi Drive (Writable) as defined in Section 1.3.

1.3 Requirements for DVD Multi Drive (Writable)

DVD Multi Drive (Writable) is for the PC attached drive. The following chart defines the minimum requirement.

Contents	Requirement
Physical Read Compatibility	DVD-ROM
	DVD-R for General*
	DVD-RW
	DVD-RAM (4.7G)
Physical Write Compatibility	DVD-R for General*
	DVD-RW
	DVD-RAM (4.7G)
Contents Playback Capability	Determined by software application.
Copyright Protection Compatibility	
Since copyright protection system is not DVD Forum specification, it is not subject to DVD Format verification but compliance to the specification of copyright protection system is recommended.	
DVD-Video	CSS
DVD-RAM, DVD-RW, DVD-R for General	CPRM
DVD-Audio	CPPM
Total copyright protection system compliance rule	CPSA

*: DVD-R for Dual Layer is not included in the DVD Multi PRODUCT REQUIREMENTS Version 1.1.

1.4 Normative References

This DVD Multi Drive (Writable) Test Specification refers to the following Test Specifications 6) to 9) for the actual test procedures and test tools.

In the event of future updates of these Test Specifications with the change of second digit (or third digit) of version number, such as from 1.0 to 1.1, DVD Multi product should comply with the updated Test Specifications, even if this DVD Multi Test Specification is not updated.

- 1) DVD Multi Specifications PRODUCT REQUIREMENTS Version 1.1
- 2) DVD Specifications for Read Only Disc
 - Part 1: Physical Specifications Version 1.0
 - Part 2: File System Specifications Version 1.0
- 3) DVD Specifications for Recordable Disc for General (DVD-R for General)
 - Part 1: Physical Specifications Version 2.1
 - Part 2: File System Specifications Version 2.1
- 4) DVD Specifications for Re-recordable Disc (DVD-RW)
 - Part 1: Physical Specifications Version 1.2
 - Part 2: File System Specifications Version 1.0
- 5) DVD Specifications for Rewritable Disc (DVD-RAM)
 - Part 1: Physical Specifications Version 2.2
 - Part 2: File System Specifications Version 2.0
- 6) DVD-ROM Drive Test Specification Version 1.0³
- 7) DVD-R Drive for General & for DL Test Specification Version 2.5
- 8) DVD-RW Drive Test Specification Version 1.6¹
- 9) DVD-RAM Drive (4.7/1.46 Gbytes) Test Specification Version 2.3¹

Note:

In the event of future updates of these specifications from 2) to 5) with the change of second digit of version number, such as from 1.0 to 1.1, DVD Multi product should comply with the updated specifications after reasonable time period, even if the DVD Multi Specifications are not updated.

The latest version of each specification will be informed in DVD FLLC web site, www.dvdfllc.co.jp.

2. DVD Logo

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

- a. License to use the Logo and
- b. DVD Specifications 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 for a product element (See **Annex B** for terminology)
Note : In this case, an applicable Test Specification should be applied.
- Initial or the latest production model at the start of Logo Program for each licensee
- Production model that supports additional Class for a product element of the DVD Multi product

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**:

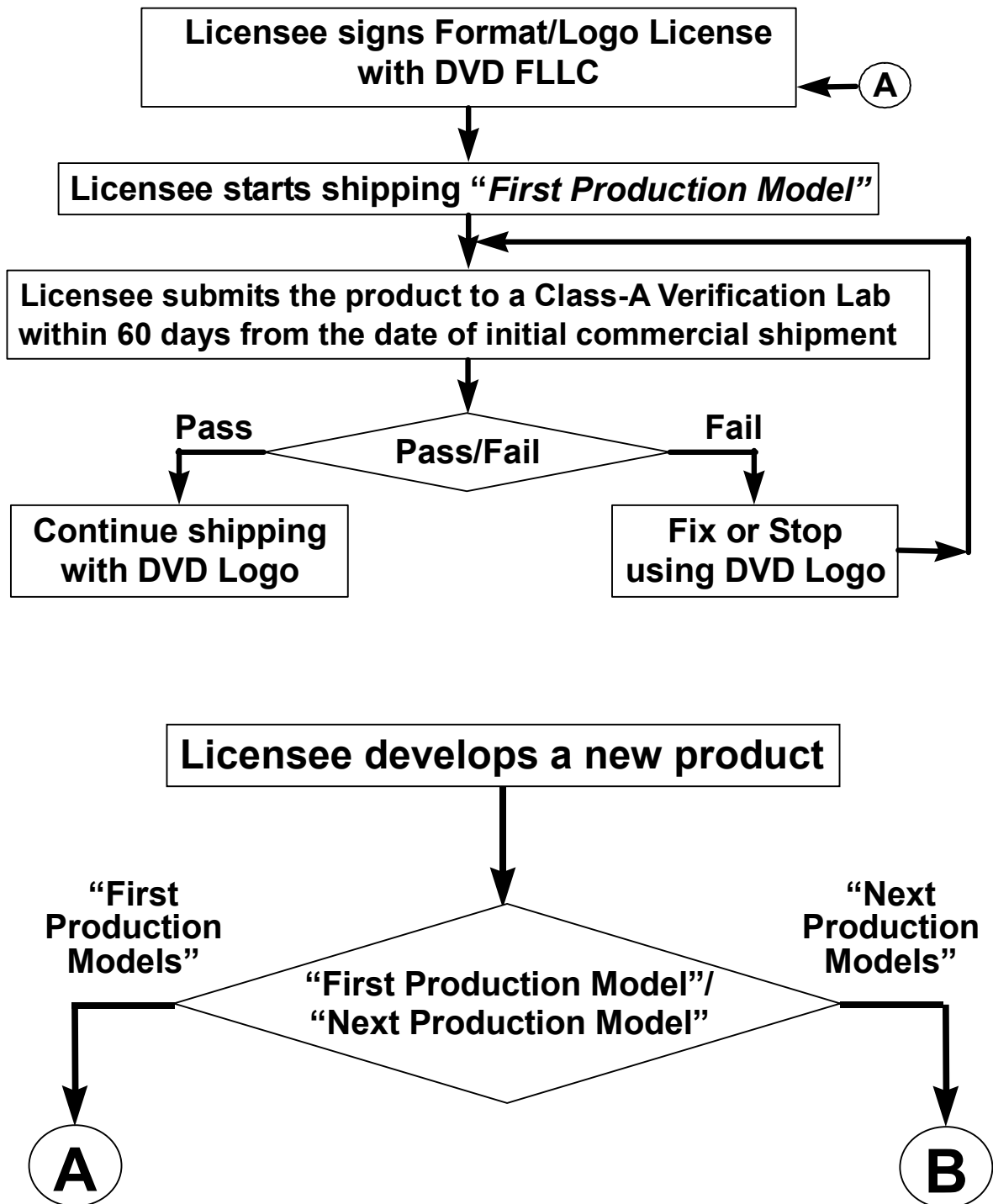
- DVD Specifications Version n.x changing to n.x+1 for a product element
- Significant changes at Licensees discretion to Pickup head, LSI and/or firmware related to DVD format
- Change to add or reduce applicable recording speed(s) without adding Class (i.e. Basic recording speed) for a product element of the DVD Multi product

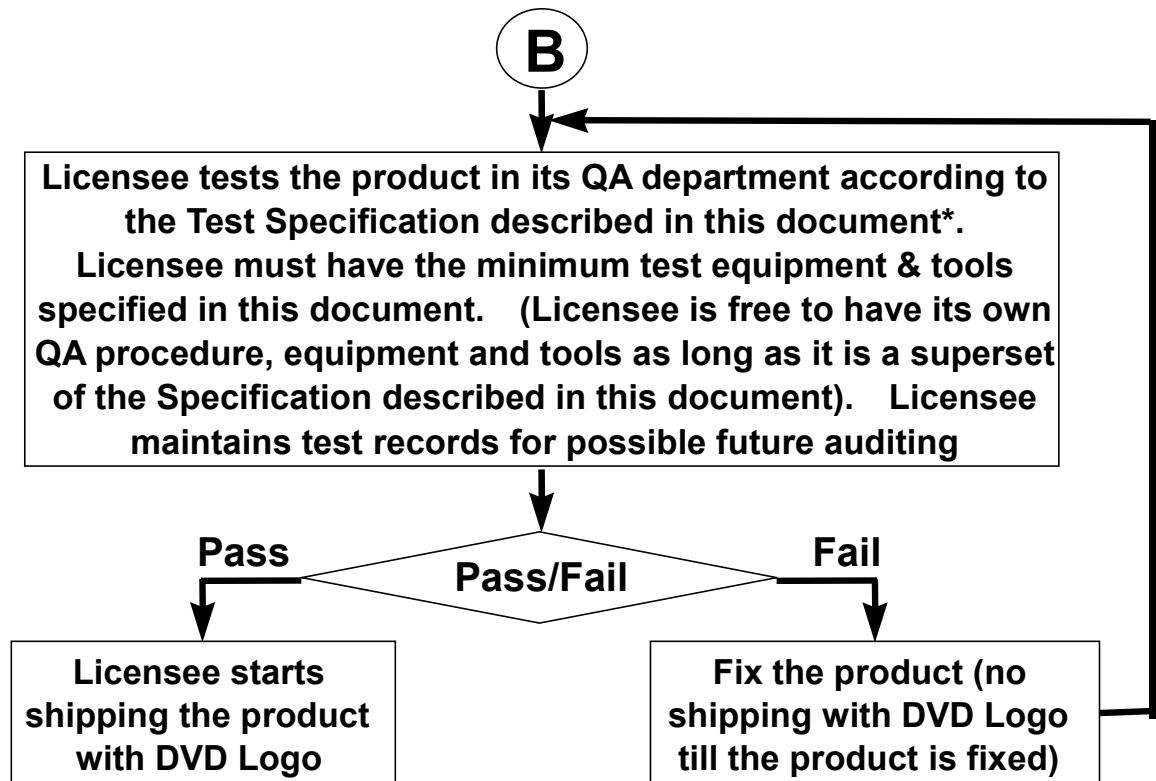
Class-A Verification Labs - Class-A Verification Labs are experts in DVD technology and provide independent expert assessment of Licensee's product compliance with DVD Specifications. Class-A labs also provide additional services such as interpretation of DVD Specifications, Test Tool development, Class-B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

Class-B Verification Labs - DVD Multi Drive (Writable) Class-B Verification Labs provide DVD Multi Drive (Writable) testing strictly according to the **DVD Multi Drive (Writable) Test Specification** (They can not interpret the specifications).

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 Multi Drive Class-B Verification Lab**.

Also licensee without QA department is recommended to consult with Class-A Lab. Certain Class-A Lab may have the function of a Class-B Lab.

3. Test requirement

3.1 Exemption of test group(s)

A DVD Multi product can be viewed as a combination of multiple product elements (i.e. DVD-ROM, DVD-R for General, DVD-RW and DVD-RAM Drive Elements).

Some or all mandatory verification test(s) for product element(s) may be exempted, if the verification for each product element had been completed as evidenced by the verification record.

Note : Determining the exemption of the mandatory verification, supporting "Class" of the product element shall be taken into consideration. For details, refer to Section 3.2 below.

- **For the First Production Model of *"Initial or the latest production model at the start of Logo Program for each licensee"***

In case the licensee had submitted and passed the mandatory verification test on individual product(s) at Class-A Lab, the test group for the corresponding product element of DVD Multi product can be exempted from mandatory verification test at Class-A Lab.

Licensee shall fill out Verification record(s) of the corresponding products in Table-1 of **Form 1BB** and submit copy of the "Confirmation of DVD Format Verification" record(s), if such exemption is applicable.

- **For the First Production Model of *"Production model that supports additional Class for a product element"***

The product element adding Class (e.g. DVD-RW) can be exempted from the mandatory verification test if the licensee had submitted and passed the mandatory verification test on the individual product at Class-A Lab.

Other product elements can be exempted from the mandatory verification test, because the licensee passed the previous verification on the DVD Multi Drive.

Licensee shall fill out Verification record(s) of the corresponding product elements in Table-1 of **Form 1BB** and submit copy of the "Confirmation of DVD Format Verification" record(s), if such exemption is applicable.

3.2 Checklist for DVD Multi product verification

This section describes how to identify the exemption of test group(s) described in Section 3.1.

Whether the mandatory verification of a test group (DVD-ROM, DVD-R for General, DVD-RW or DVD-RAM) can be exempted or not will be determined in the following steps by using the **Table 3.2-1** below:

- If the test group has Class 1 (or later) defined (e.g. DVD-RW)
 - Check either Box in "Nomination of Product element" according to the supporting Class of the DVD Multi Drive.
 - Check the Box(es) in "Already verified product" if the licensee had passed the verification of the product(s).
 - If the nominated Class is covered by the verified Class (i.e. all the nominated Class numbers are included in the verified Class numbers), the mandatory verification of the test group can be exempted.
- If the test group does not have Class 1 (or later) defined (e.g. DVD-R for General)
 - Check the Box in "Already verified product" if the licensee had passed the verification of the product. If checked, the mandatory verification of the test group can be exempted.

In case all the four test groups can be exempted, the licensee may be waived from submitting the DVD Multi product to Class-A Lab by submitting the "Preliminary Information for DVD Format Verification" together with copy of the Confirmation of DVD Format Verifications. Otherwise, the DVD Multi product must be submitted to Class-A Lab as **First Production Model**.

Note: The above steps are derived from the definition of "First Production Model" in the reference Test Specification that incorporates Class 1 (or later). In the Specification, "support of additional Class" is classified into "First Production Model". Therefore, if the DVD Multi product to be verified supports additional Class in comparison with the already verified product(s) for the licensee, mandatory verification as the First Production Model is necessary for that element.

Table 3.2-1: Checklist for DVD Multi Drive (Writable) verification

Nomination of Product element	Already verified product*	
DVD-ROM Drive	<input type="checkbox"/>	DVD-ROM Drive
DVD-R for General Drive (Class 0)	<input type="checkbox"/>	DVD-R for General Drive (Class0)
<input type="checkbox"/> DVD-RW Drive (Class 0) or	<input type="checkbox"/>	DVD-RW Drive (Class 0)
<input type="checkbox"/> DVD-RW Drive (Class 0&1)	<input type="checkbox"/>	DVD-RW Drive (Class 0&1)
<input type="checkbox"/> DVD-RAM Drive (Class 0) or	<input type="checkbox"/>	DVD-RAM Drive (Class 0)
<input type="checkbox"/> DVD-RAM Drive (Class 0&1)**	<input type="checkbox"/>	DVD-RAM Drive (Class 0&1)**

* : As an individual product, or a product element of the DVD Multi Drive

** : At the time of approval of this TS (August 2005), Class 1 has not been defined for DVD-RAM. These items will become effective when the Class 1 is defined in the DVD-RAM Specification and reference Test Specification.

3.3 License status of copyright protection system

Since copyright protection system is not DVD Forum specification, it is not subject to DVD Format verification. However, compliance to the specification of copyright protection system is recommended. Licensee shall fill out the license status of copyright protection system in Table-2 of **Form 1BB**.

4. Test procedures for each test group

This chapter describes how to carry out the test for the physical and logical compliance testing.

This DVD Multi Drive (Writable) Test Specification refers to the Test Specification of each test group (i.e. DVD-ROM, DVD-R for General, DVD-RW and DVD-RAM Drive), instead of describing actual test specifications and test tools in this document.

For the reference Test Specifications, refer to the **1.4 Normative References**, and use the latest version of them downloadable from DVD FLLC Web-site (<http://www.dvdfllc.co.jp>).

For each test group to be verified, which are determined through Sections **3.1** and **3.2**, verification shall be carried out according to the procedures shown in the following sections.

Note : In the following sections, Section / Chapter numbers and Form numbers in the reference Test Specifications are described for reference purpose, however, they may be subject to change according to any update of the Test Specifications. Follow the latest information in the reference Test Specifications.

4.1 DVD-ROM Drive Element

For test of this element, refer to the Normative Reference 6) defined in **1.4**, replacing the term of DVD-ROM Drive with DVD Multi Drive (Writable).

4.1.1 Test Tools

Refer to Section **3.1 Test Tools** of the reference Test Specification.

4.1.2 Test Specifications

Refer to the Section **3.2 Test Specifications** of the reference Test Specification, and carry out the procedures described in the section.

- **Necessary Form**
Form 3B

4.2 DVD-R for General Drive Element

For test of this element, refer to the Normative Reference 7) defined in **1.4**, replacing the term of DVD-R Drive for General or SL Drive with DVD Multi Drive (Writable).

4.2.1 Determination of test procedures to be carried out

Refer to the Section **3.1 Test procedure for SL Drive** of the reference Test Specification, and determine the test procedures to be carried out according to the nominated Product type of the DVD-R for General Drive Element of the DVD Multi Drive.

4.2.2 Test Tools

Refer to each Chapter of the reference Test Specification.

4.2.3 Test Specifications

Refer to the Chapters of the reference Test Specification, which are determined in Section **4.2.1** above, and carry out the procedures described in the Chapters.

- **Necessary Forms**

Form 2T (To clarify the supporting speeds and necessary Forms)

Form 3T to 6T (Test results of 12cm/1x-speed SL test)

Other necessary Forms listed in **Form 2T** (2/2)

4.3 DVD-RW Drive Element

For test of this element, refer to the Normative Reference 8) defined in **1.4**, replacing the term of DVD-RW Drive with DVD Multi Drive (Writable).

4.3.1 Determination of test procedures to be carried out

Refer to the Chapter **3. General procedure of Test** of the reference Test Specification, and determine the test procedures to be carried out according to the nominated Product type of the DVD-RW Drive Element of the DVD Multi Drive.

4.3.2 Test Tools

Refer to each Chapter of the reference Test Specification.

4.3.3 Test Specifications

Refer to the Chapters of the reference Test Specification, which are determined in Section **4.3.1** above, and carry out the procedures described in the Chapters.

- **Necessary Forms**

Form 2L (To clarify the supporting Class/speeds and necessary Forms)

Form 3L to 7L (Test results for 12 cm/1x-speed test)

Other necessary Forms listed in **Form 2L** (2/2)

4.4 DVD-RAM (4.7Gbytes) Drive Element

For test of this element, refer to the Normative Reference 9) defined in 1.4, replacing the term of DVD-RAM Drive with DVD Multi Drive (Writable).

4.4.1 Determination of test procedures to be carried out

Refer to the Section **1.1 Scope** of the reference Test Specification, and determine the test procedures to be carried out according to the nominated product type of the DVD-RAM element of the DVD Multi Drive.

4.4.2 Test Tools

Refer to each Chapter of the reference Test Specification.

4.4.3 Test Specifications

Refer to the Chapters of the reference Test Specification, which are determined in Section 4.4.1 above, and carry out the procedures described in the Chapters.

- **Necessary Forms**

Form 2O (To clarify the supporting speeds, etc.)

Form 3O to 12O (Test results for 12 cm/2x-speed test)

Other necessary Forms for the test procedures determined in Section 4.4.1 above

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.

Hitachi Consumer Electronics Co., Ltd.

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Fax: +81-45-866-5905

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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>

Sony Corporation

Verification Laboratory

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

Fax: +81-50-3750-6608

Annex B

Glossary of Terms used

DVD-ROM	: DVD Read Only Disc defined by the Normative Reference 2) in 1.4
DVD-R for General	: DVD Recordable Disc for General defined by the Normative Reference 3) in 1.4
DVD-RW	: DVD Re-Recordable Disc defined by the Normative Reference 4) in 1.4
DVD-RAM	: DVD Rewritable Disc defined by the Normative Reference 5) in 1.4
Product element	: An element composing DVD Multi Drive (Writable), i.e. DVD-ROM Drive, DVD-R for General Drive, DVD-RW Drive or DVD-RAM Drive Element.
Test group	: Test for a product element
Reference Test Specification	: Test Specification to be referred to for a test group, defined by the Normative Reference in 1.4

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.

If all the four test groups are to be exempted according to the provision of **3.1/3.2**, following **Self Test** and **Application** are not necessary. Instead, copies of the corresponding verification records shall be submitted together with **Form 1BB**.

Preliminary Application

Applicant must complete **Form 1BB** to provide preliminary information

Self Test

Applicant must test the product in accordance with this Test Specification prior to submitting to a Class-A Verification lab. Applicant must complete **Form 2BB** and **necessary Forms** to provide test results.

Note:

For the necessary Forms to be filled up, see Chapter **4**. of this document.

Applicant shall use the latest Forms from DVD FLLC Web site (<http://www.dvdfllc.co.jp>).

If there is any test group to be exempted according to the provision of **3.1/3.2** and copy of the corresponding verification record is submitted together with **Form 1BB**, the Forms for that test group shall be exempted.

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 3 product samples along with said necessary Forms and the NDA.

Test Result

Upon completion of testing, Verification Lab will complete **Form 3BB** to inform the applicant and DVD Format/Logo Licensing Corporation of the test results.

Annex D

Test Tool Contact Information

Refer to each reference Test Specification.