
Archiving & Migration by using Optical Discs Technology



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JVC Advanced Media Europe

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“3 – 2 – 1” concept for preservation medium



THREE copies



Two Different Technologies



One Different Location

Is 4.7GB really inconvenient??

Document Digitization



250KB PDF documents
19,000 pages

Recorded sound



<i>bit</i>	<i>kHz</i>	<i>One DVD</i>
16	44	490min
24	96	122min
24	192	67min

Photos



3.0MB Film
1,600 photos

Optical Discs have high capability of digital data preservation

- **AUTHENTICITY** : Data cannot be altered when once recorded
- **OBSOLESCENCE RISK** : Largest format and standard
- **RISK FINDING** : Extremely easy by checking error rate
- **STORGAE** : Wider flexibility (recommended at 25C + 50% RH)
- **MANAGEMNT**: Extremely easy as bookshelf
- **ZERO VIRUS RISK**: Off line copies. No risks.

Are all discs safe?

There had been no worldwide standard that defines the test method to estimate the longevity of optical discs, has caused many misunderstandings in this industry regarding archival grade products.

Development Concept “Error rate control”

*“SAFE” and “LONG TERM” is defined by
complying to international standard, ISO/IEC.*

record it.
store it.
Inspect it.
with peace of mind.

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Archiving & Migration Solution

① **ISO/IEC10995**

For low occurrence of initial error rate

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② **ISO/IEC29121**

To monitor error rate escalation

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**Visible Long term
preservation**

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Status of standards related to archiving for optical discs

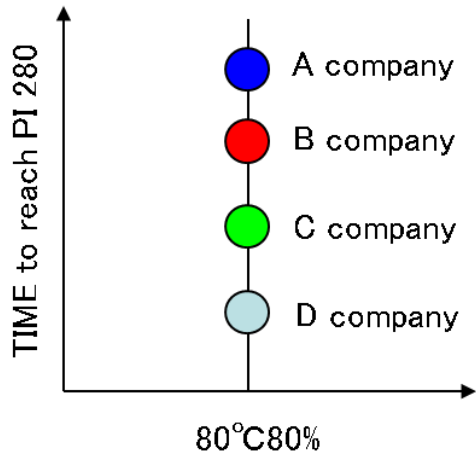
		Life expectancy test	Operation
CD	ISO	ISO 18927 ISO/IEC 16963	
	JIS		JIS Z6017
DVD	ISO	ISO/IEC 10995 ISO/IEC 16963	ISO/IEC 29121
	JIS		JIS X 6255 JIS Z 6017
BD	ISO JIS	Being standardized by the optical disc industry organization.	

JIS: Japanese standards



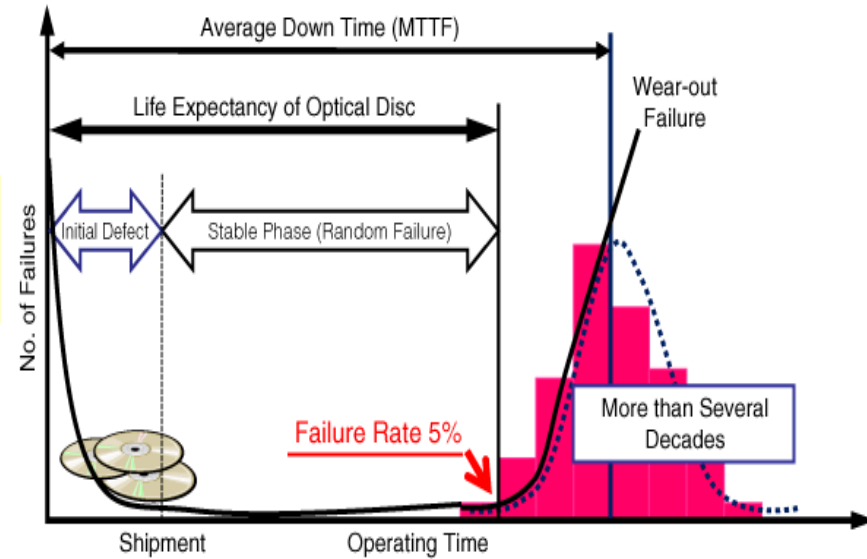
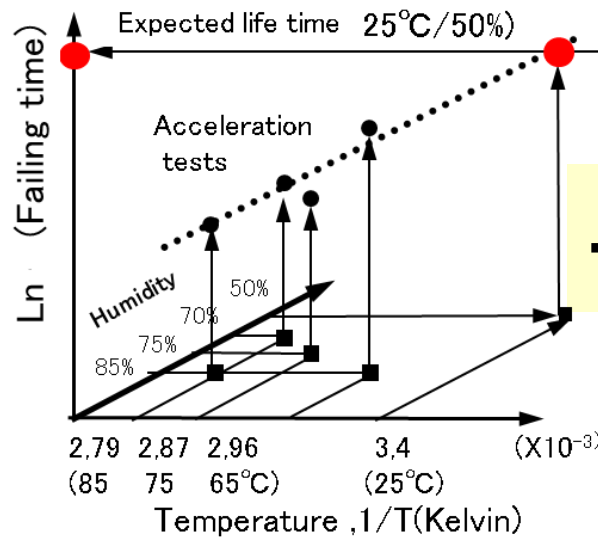
ISO/IEC10995 vs. General test

General Test



(Simplified into a 2-dimensional graph)

ISO/IEC10995, ISO/IEC16963 Test



We used to use one stress condition to estimate the life time.

However, does using the break-test method really estimates longevity at users' storage condition?

We think multiple conditions' test are mandatory to give users longevity information as accurate as possible even if the test is time and resource consuming.

This is what ISO test focus on and we are utilizing this method to deliver safe operation to users.

ISO/IEC29121 – For visible evaluation of media condition

ISO/IEC29121 defines the safe level of errors at the time of recording and during storage.

			Book spec (Disc format)	Migration Standard		
				ISO/IEC29121	JIS Z 6017(Japan)	DA/T38(China)
Initial Recording Performance	Level 1	Reccomended	<280 (Disc manufacturer to comply at the time of manufacturing)	<140	<100	<80
	Level 2	Should not be used		140-280	-	-
	Level 3	Shall not be used (out of spec)		>280	-	-
recording performance at periodical test	Level 1	Use as it is		<200	<140	<140
	Level 2	Migrate to another disc ASAP		200-280	140-280	<180
	Level 3	Migrate to another disc immediately or might not be retrievable		>280	>280	>240
Testing period of recording performance		-	-	Every 3 years or less	Every 3 years	Every 2 years or less

**Error rate is a direct index to show the media's condition.
=> Error management enables users to avoid data loss.**



For Audio Preservation (IASA-TC04 Guidelines)

Maximum error levels in an archival CD-R

Frame burst errors FBE	<6
Block error rate BLER average	<10
Block error rate BLER peak	<50
E22 (correctable errors)	0
E32 (uncorrectable errors)	0
3R Jitter	<35nS

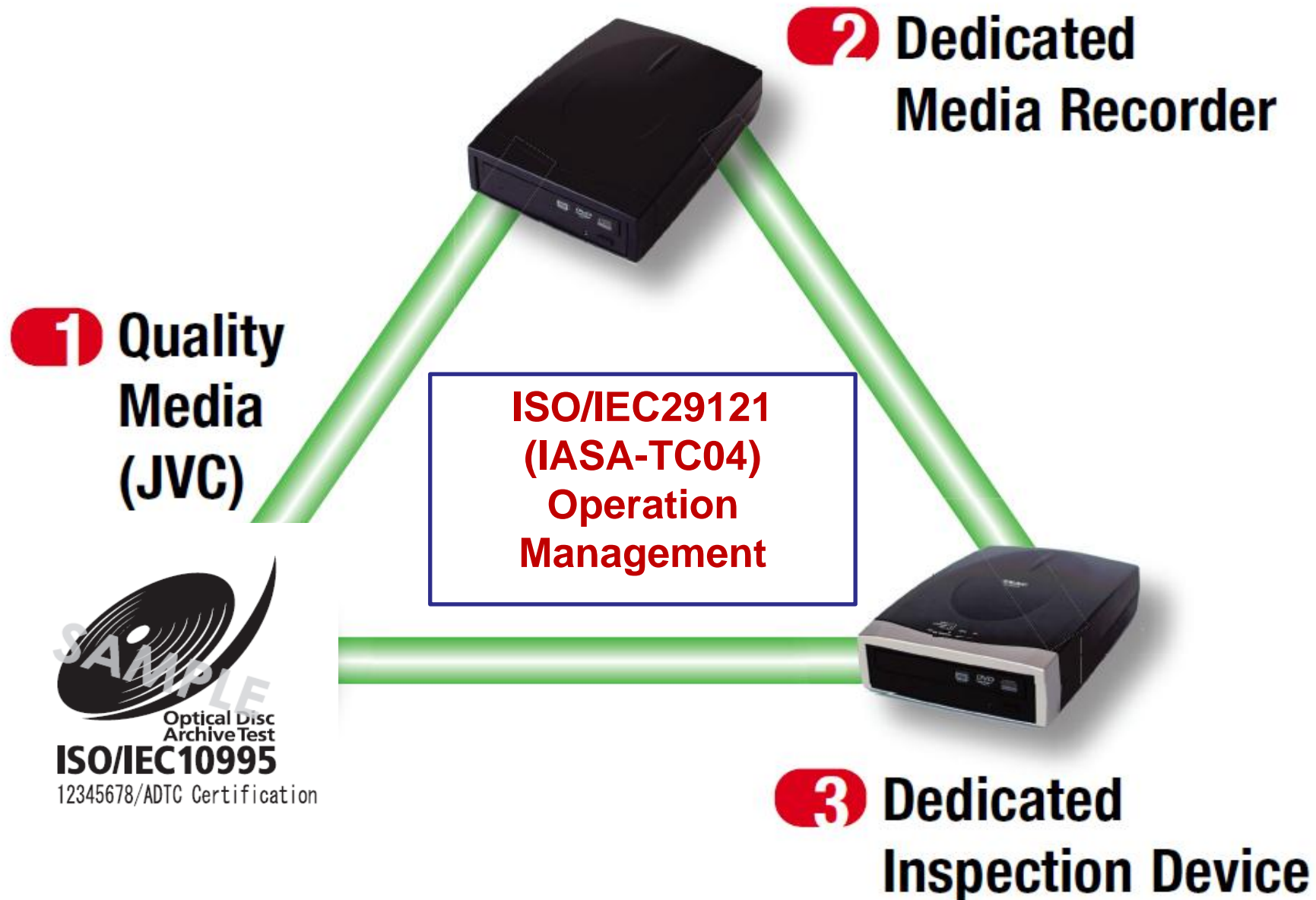
Maximum error levels in an archival DVD-R

Parity Inner Errors PIE	<70
Parity Outer Errors POE	0

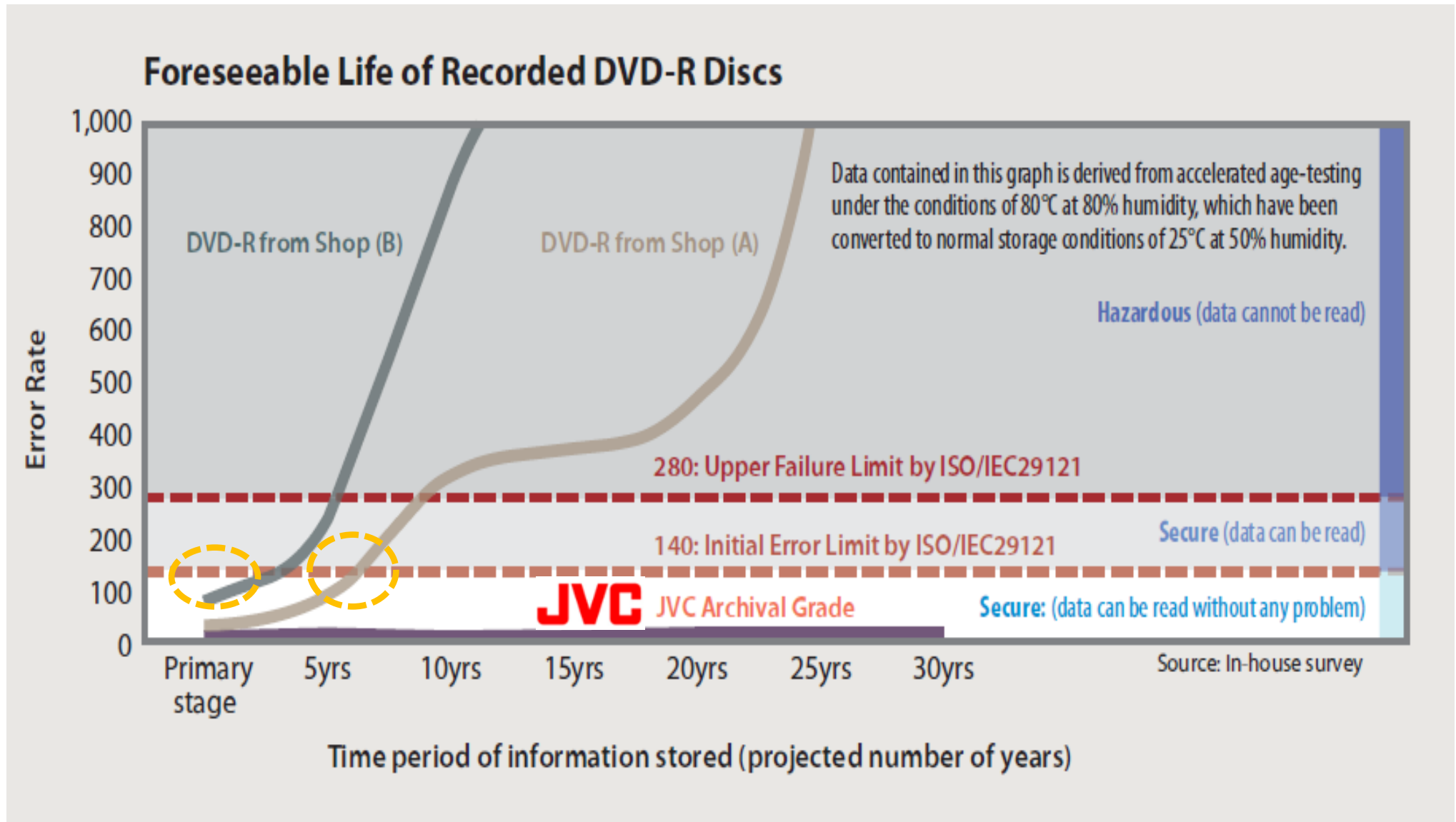
The guideline requires the test at the initial recording stage and during the storage.

It requires undertaking a recopying when the error rate increase.

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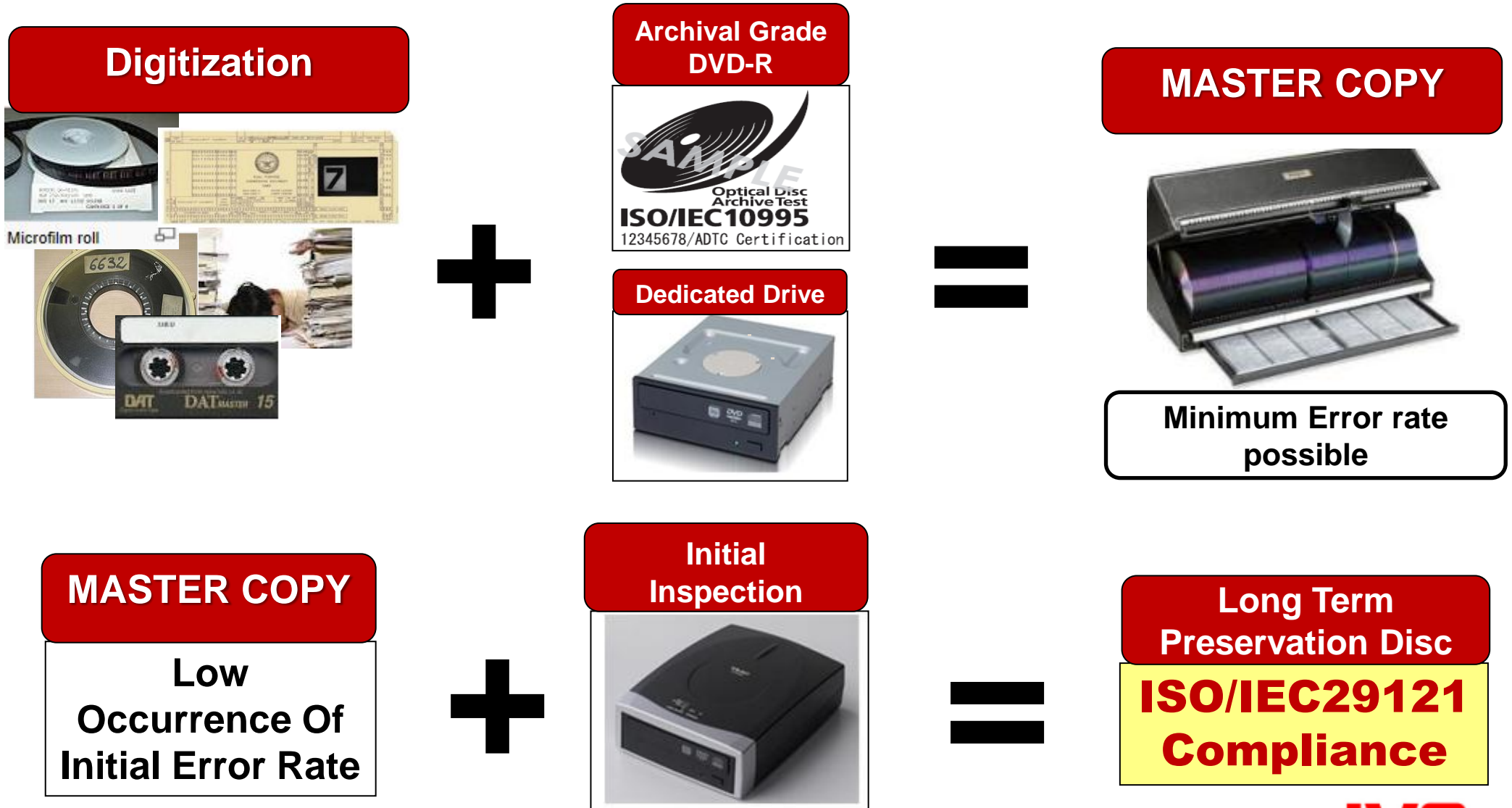


JVC Solutions brings you safe and long



Usage example 1 “MASTER COPY CREATION”

After digitization process, a master copy to be made for long term preservation of the data.



Usage example 2 “Check & Migrate”

ALREADY under storage



Carton Arrival



Incoming inspection



ISO/IEC29121 Compliance

Risk Finding Process

High Error rate disc



Archive Grade Media



Dedicated Drive



MASTER COPY Revival

Data back to ISO/IEC29121 operation

Safe & Long Term are defined.

① ISO/IEC10995

International standard defining **the** test condition
to estimate DVD-R longevity

&

② ISO/IEC29121

International standard defining **a** safe level of error rate
at the time of writing and during storage

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**Best Practice and Visible
operation**