

Reference Archive Media Data Sheet

KODAK Reference Archive Media 1433/3433



Description

Kodak Reference Archive Media has been specially formulated for use in the Kodak i9600 Series Writers and the Kodak Digital Science™ Document Archive Writer, Model 4800, to provide high-quality, human-readable, reference archives of digital images.

The high-resolution archival-quality images are easily re-digitized for online access and retrieval to provide short-term validation and long-term storage of records. This media provides clear, high-contrast, and sharp images that can be distributed according to the requestor's needs as hard-copy output, faxes, or e-mail attachments, or posted to an image server using your current compression scheme. The requesting parties, whether users on your network or external customers or auditors, can then be directed to these images via links embedded in e-mails.

Product Applications

Kodak Reference Archive Media and the i9600 Series Writers provide the easiest way to help protect your critical business records from tampering or loss. Reference Archive Media renders a trustworthy copy of an electronic record to validate a transaction that will satisfy litigation and meet regulatory and audit requirements. These images can be used in reconstructing a record even if backup tapes, hardware, and software become obsolete.

You can avoid much of the expense and hazard of digital-only records storage by Reference Archiving critical business documents. Based upon technology developed by Kodak, Reference Archiving copies the records you wish to secure to an analog format on ISO-standard archival media. All of the information included in the original record is captured, in context. These non-volatile documents can be accessed electronically to authenticate current activities, such as an online transaction, or to support audit activities triggered by regulatory activities and legal actions. You can also be assured of long-term access and retrieval.

This media has a Life Expectancy of at least 500 years when processed and stored according to the recommended practices of ISO and ANSI.

Media Features

- **Manufactured to ISO and ANSI standards for LE-500 films**
- **High resolution and excellent halation protection provide superior output of digital images**
- **Superior latent image keeping**
Minimal degradation of image density between time of exposure and delayed processing.
- **Process insensitive**
Image quality and background density are not significantly affected by typical operational variations in processing.
- **Roll-to-roll and emulsion batch-to-batch consistency**
Minimizes the need for adjustments or operator intervention between rolls or batches of media.

Kodak Reference Archive Media is coated on polyester (PET) base, meeting ISO requirements for safety film (ISO 18906).
- **Process-surviving anti-static backing**
Even after processing, static protection is maintained, reducing dirt and static problems in retrieval, scanning, and duplicating equipment.

Physical Properties

Nominal Thickness Data

Media	1433	3433
Estar Base	5 mil (0.127 mm)	2.5 mil (0.064 mm)
Emulsion	0.2 mil (0.005 mm)	0.2 mil (0.005 mm)
Backing	Negligible*	Negligible*
Total Mils**	5.2 (0.132 mm)	2.7 (0.069 mm)

* Static-resistant and process-survivable

** Before processing

Photographic Properties

Spectral sensitivity: Specially formulated to match the exposure device of the *Kodak Digital Science* Digital Document Archive System.

Resolving power: Based on recommended process.

Test-Object Contrast	Lines/mm
1.6:1 (ISO-RPL)	200
1000:1 (ISO-RP)	630

These values were determined according to a method similar to ANSI/ISO 6328-1982, *Photography—Photographic Materials—Determining the Resolving Power of Photographic Materials, Method for*, except that the light source used was a high-pressure mercury arc.

Process Handling and Storage

Handling

Closed cartridges or film on standard flanged spools should be handled in subdued light. Subdued light may be used while loading and unloading the *Kodak Digital Science* Archive Writer Cassette, Model 66, for Reference Archive Media 3433 or a *Kodak Imagelink* Smart Cassette 100 for Reference Archive Media 1433.

Unprotected *Kodak* Reference Archive Media should be handled in total darkness. However, should a safelight be required for physical safety reasons, you can use a *Kodak* No. 3 Green Safelight Filter with a 7.5 watt bulb at a minimum of eight feet from the media. Packaged media may be handled in room light.

WARNING: This media may be handled under safelight conditions only for a limited time. Testing under actual use conditions should be done before taking this risk.

Media Storage Before Use

Keep unopened packages at 21°C (70°F), 50% relative humidity or below, and protected from radiation and X-rays. To avoid moisture condensation on media that has been refrigerated, do not open the package until the media has warmed throughout to normal room temperature, about 1 to 1 1/2 hours.

Processor Setup Specifications for KODAK Reference Archive Media 3433

	Developer		Fixer		Dryer	Dilution	
	Time (sec.)	Temperature	Time (sec.)	Temperature	Temperature	Dev	Fix
Kodak Prostar	13.5	37.8°C (100°F)	13.5	35.6°C (96°F)	57.2°C (135°F)	RTU*	RTU*
Medium Tank**	23	32.2°C (90°F)	23	29.4°C (85°F)	71.1°C (160°F)	1:2	1:2
Deep Tank**	48	29.4°C (85°F)	32	29.4°C (85°F)	71.1°C (160°F)	1:7	1:3

* RTU = Ready To Use

** NOTE: The above dwell times and temperatures are starting points only. Specific systems or customer needs may demand variation from these values based on photographic aims. Dwell time is determined by timing media speed from entrance roller to exit roller while running in the processor.

Processing Information

Processors

Kodak Reference Archive Media can be processed in most typical continuous-strand type *Kodak Prostar*, medium-tank, and deep-tank processors.

Processing Chemicals

Kodak Reference Archive Media has been designed and tested to yield optimum results utilizing common Kodak Processing Chemicals and parameters. However, it is compatible with other standard microfilm processing equipment and high-quality chemicals (results may vary).

IMPORTANT: For best results and to avoid aeration, always add chemical concentrate to water, not water to concentrate.

Replenishment Rates

Use the chart and formula provided to determine the developer and fixer replenishment rates (mL/min) by multiplying transport speed (ft/min) (determined by dividing the path length of the developer tank in feet by the dwell time in seconds and multiplying by 60; see example) and the appropriate processor replenishment specification (mL/linear foot).

Replenishment Specification (mL/linear ft)		
Type of Processor	16 mm	
	Dev	Fix
<i>Kodak Prostar</i>	0.75	0.75
Medium tank	0.80	0.75
Deep tank	1.00	1.25

$$\text{Transport speed (ft/min)} \times \text{ft of film (mL/Lft)} = \text{Replenishment rate (mL/min*)}$$

*1 mL/min = 1 cc/min

Example

Processor: *Allen M70*
 Type of film: 16 mm
 Dwell: 43 seconds
 Developer film path: 154 feet

See table above for:

Replenishment (Dev): 1
 Replenishment (Fix): 1.25

Calculated transport speed:

$$\frac{154 \text{ feet}}{43 \text{ sec}} \times \frac{60 \text{ sec}}{1 \text{ min}} = 215 \text{ ft/min}$$

Replenishment results:

$$\frac{215 \text{ feet}}{\text{min}} \times \frac{1.0 \text{ mL}}{\text{feet}} = 215 \text{ mL/min*}$$

(developer replenishment)

$$\frac{215 \text{ feet}}{\text{min}} \times \frac{1.25 \text{ mL}}{\text{feet}} = 268 \text{ mL/min*}$$

(fixer replenishment)

A bluish tint in the background is a normal post-process characteristic of this media. Extreme variations from the recommended processing conditions will affect the severity of the tint. This characteristic does not negatively affect image permanence, quality, or reproducibility.

Image Stability—Post-Processing

This media is manufactured to ANSI and ISO specifications for extended-term storage use. When processed as recommended, this media meets both ANSI and ISO specifications intended for long-term storage. This media has a Life Expectancy LE-500 rating.

ISO 18901:2002, *Photography—Processed Silver-Gelatin Type Black-and-White Film—Specifications for Stability*, states that the maximum permissible concentration of thiosulfate ion is 0.014 grams per square metre for extended-term storage. ISO 18901 has superseded ANSI/NAPM IT9.1-1992. Requirements have not changed.

Media Keeping—Post-Processing

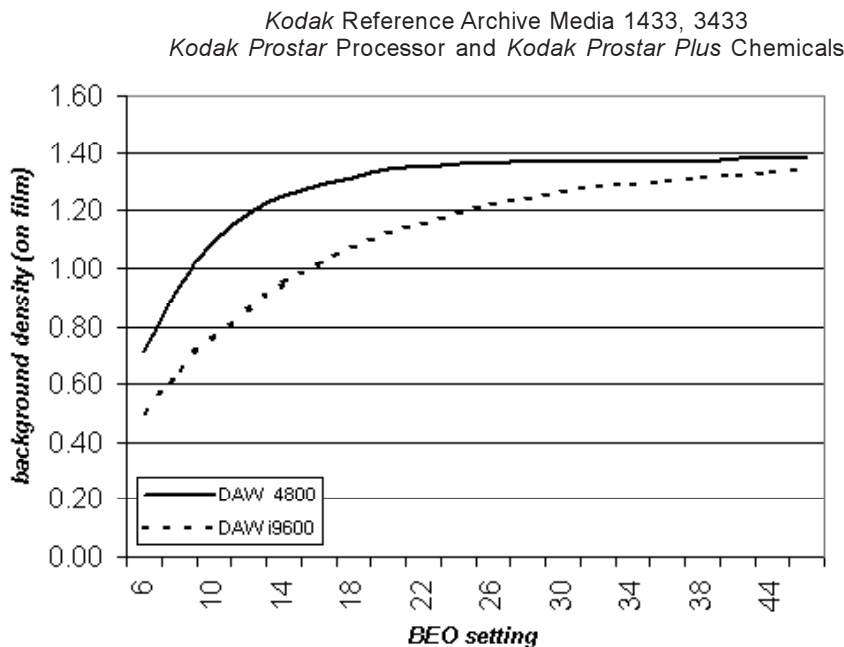
ISO 18911-2000, *Photography—Processed Safety Photographic Films Storage Practices*, give appropriate conditions for extended-term (permanent) and long-term storage. These are the same requirements as previously stated in ANSI/NAPM IT9.11-1993.

Obtain these ANSI and ISO Standards through one of these ways:

- Contact the Association for Information and Image Management International (AIIM):
<http://www.aiim.org>
or
1100 Wayne Avenue, Suite 1100
Silver Spring, MD 20910-5603
- Call 1-301-587-8202
- Visit the American National Standards Institute (ANSI) Internet web site:
<http://www.ansi.org>

NOTE: Refer to the latest revision of each ANSI or ISO Standard specified.

BEO* Intensity vs. Density

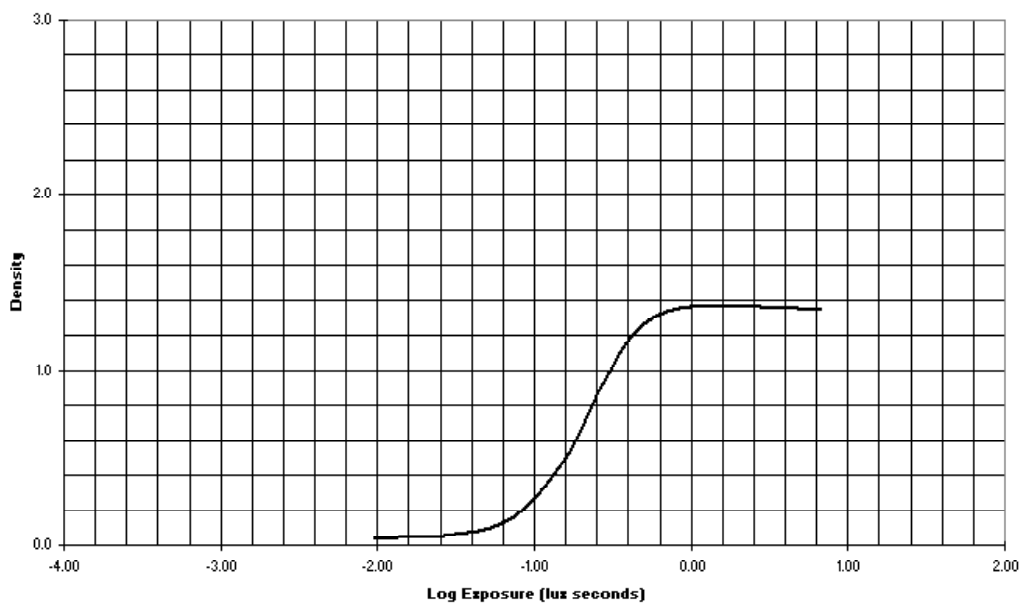


* BEO = Brightness Emitter Optimization—a measure of the light intensity of the LEDs, which is controlled by the amount of time the LEDs are on.

Notice: While the data presented are typical of production coatings, they do not represent standards which must be met by Eastman Kodak Company. Varying storage, exposure, and processing conditions will affect results. The company reserves the right to change and improve the product characteristics at any time.

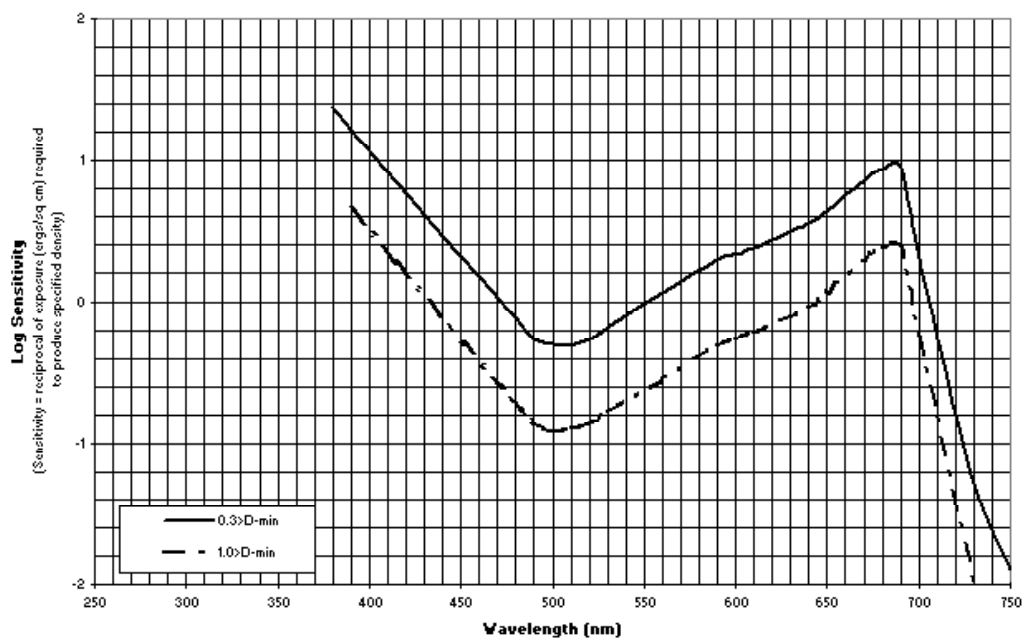
Characteristic Curve

Kodak Reference Archive Media 1433, 3433
Kodak Prostar Processor and Kodak Prostar Plus Chemicals



Spectral Sensitivity Curve

Kodak Reference Archive Media 1433, 3433
Xenon Flash exposure, 85 microseconds, KODAK WRATTEN 29 Filter:
Kodak Prostar Processor and Kodak Prostar Plus Chemicals



Ordering Information: Reference Archive Media

Code	Mil	Format	Spec	Description	No./Case	CAT No.
1433	5	16 mm x 100 ft	615	R-186 Black plastic spool*	20	153-4601
3433	2.5	16 mm x 215 ft	615	R-186 Black plastic spool**	20	862-5147

* Uses *Kodak Imagelink* Smart Cassette 100, CAT No. 153-7166

** Uses *Kodak Digital Science* Archive Writer Cassette, Model 66, CAT No. 868-4383

Ordering Information: Chemicals

Chemical	CAT Number	Working Strength Solutions
Microfilm DEVELOPER AND Replenisher—Concentrate		At 1:7 yields
1 gal—4/case	177-8869	32 gal
5 gal—1 cube	190-1891	40 gal
50 gal—1 drum	190-1917	400 gal
Microfilm FIXER AND Replenisher—Concentrate		At 1:3 yields
1 gal—4/case	817-7222	16 gal
5 gal—1 cube	190-1149	20 gal
50 gal—1 drum	190-1164	200 gal
Kodak Prostar Processors		Ready-to-Use Solution
Prostar Plus Developer 1 gal 4/case	102-2490	4 gal
Prostar Plus Fixer 1 gal 4/case	102-2656	4 gal

Material Safety Data Sheets (MSDSs) on the chemicals (only) are available by contacting Kodak at 1-800-242-2424 or www.kodak.com/go/msds. You will need to supply the *Kodak* catalog numbers of the chemicals for which you need MSDSs. Material Safety Data Sheets for the actual working solutions and caution labels for the processor tanks are also available by calling the same number.

READ THIS NOTICE

The sensitometric curves and data in this publication represent product tested under the conditions of exposure and processing specified. They are representative of production coatings and, therefore, do not apply directly to a particular box or roll of photographic material. They do not represent standards or specifications which must be met by Eastman Kodak Company. The company reserves the right to change and improve product characteristics at any time.

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www.kodak.com/go/docimaging

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