



KODAK RELIABLE IMAGE TIP # 81



Considerations for archive storage, service bureau offerings, and RFP/Bid suggestions

What a Service Bureau Should Be Able To Do With Archive Film

(Archive inspection is totally different than normal daily microfilm inspection)

Below are just a few of the attributes lab personnel should have to perform Archive Inspections.

- Understand long term storage conditions and storage specifications and be able to evaluate and comment on these conditions.
- Inspectors must be able to distinguish acetate film from polyester film.
- Inspectors must be able to distinguish duplicates from originals. (Silver to silver and silver to non-silver)
- Be able to distinguish if Vinegar Syndrome is present in acetate films and what stage is the deterioration process
- Be able to distinguish if the archive is affected by Redox or other effluents and what to do with the film.
- Know how to categorize the affected film and how to prioritize the next steps
- Be able to provide a go forward plan for the customer on what was found in the inspection and what needs to be done next and, into the future.

The following steps must be taken to inspect and correct problems found with microfilm in an archive.

1. Identify each roll of film by:
 - a. Roll number and date filmed or inventory provided
 - b. Film size (16mm or 35mm)
 - c. Film type (Acetate/Polyester, Silver/Non Silver, Original/Duplicate)

2. Inspect each roll for the following conditions:
 - a. Vinegar Syndrome – using A/D strips to measure the degree of acidity. If vinegar syndrome is present, note the degree of acid content on the Inspection Report. Also, look for visual defects such as curling, shrinking and buckling of the film.
 - b. Redox/Mold/Mildew – inspect each roll of film on a light table to look for rust spots or any other type of deterioration.
3. A written report of all findings and recommendations for corrective action must be created.
 - a. Review report prior to any corrective action.
4. Corrective Action:
 - a. Upon customer approval, make the corrective actions.
 - b. Corrective actions may include silver duplicates, brown toning, acid and lignin free boxes, acid free labels, acid free ink on labels and molecular sieves.
 - c. Further protection can be achieved by protective buttons and strings added to each roll of film.
5. Delivery of Film:
 - a. Once all corrective actions had been taken, return the film to the customer for verification of inventory and for return shipment to storage facility.

STANDARDS RELATING TO PRESERVATION MICROFILMING, PROCESSING, DUPLICATION AND RECONSTRUCTION

A company who provides preservation services should be familiar with, understand, abide by, and be able to communicate the information contained in the Standards listed below. These standards can also be incorporated into an RFP or Bid.

- **ISO-14523-1919-Photographic Activity Test for Enclosure Materials**
- **ISO-18901-2002-Processed Silver – Gelatin Type Black and White Films- Specifications for Stability**

- **ISO-18906-2000-Specification for Safety Film**
- **ISO-18911-2000-Processed Safety Photographic Films-Storage Practices**
- **ISO-18915-2000-Methods for the Evaluation of Chemical Conversion of Silver Images Against Oxidation**
- **ISO-18917-1999-Determination of Residual Thiosulfate and Other Related Chemicals in Processed Photographic Materials. Methods Using Iodine-Amylose, Methylene Blue, and Silver Sulfide.**
- **ISO-18921-2002-Compact Discs (CD-ROM) – Method for Estimating the Life Expectancy Based on the Effects of Temperature and Humidity**
- **MS-18-1998-Splices for Imaged Microfilm – Dimensions and Operational Constraints**
- **MS-23-1998-Inspection and Quality Control of First Generation Silver Microfilm**
- **MS-42-1989-Practices for Expungement, Deletion, Correction or Amendment of Records on Microforms**
- **MS-43-1998-Inspection and Quality Control of Duplicate Microforms of Documents and From COM**
- **MS-45-1990-Inspection of Stored Gelatin Microforms for Evidence of Deterioration**
- **MS-48-1990-Practice for Microfilming Public Records on Silver-Halide Film**
- **MS-111-1994-Microfilming Printed Newspapers**
- **TR-13-1998-Preservation of Microfiche in an Active Environment-Guideline**

Questions to ask a film storage company prior to storing film in their location (note, some of these services may be chargeable):

- √ Do you have a separate vault for microfilm?
- √ Do you screen all microfilm that is stored in your vault?
- √ Do you require all films to be Brown Toned (polysulfide treated) prior to entry into your vault?
- √ If my film reels have molecular sieves in them will you replace them annually?
- √ Do you provide annual inspection of my films and do you provide a report of this inspection?
- √ What are the environmental conditions where my films will be stored (Temperature & RH) and are they constant?
- √ Does the microfilm vault have a conditioned and filtered air supply?
- √ Will my films be stored with other microfilm that has not first been inspected for Vinegar Syndrome, Redox, Mold, Mildew, etc.?
- √ Are your people trained to evaluate microfilm for the anomalies mentioned above? Have they attended a certified training course such as the Kodak Reliable Image Seminar or the Kodak Keeping the Legacy of Trust Seminar or other industry classes?
- √ What guarantees can you provide me that my film will be safe from airborne oxidants, fire, water, etc.?

Room Specifications for Microfilm Controlled Storage

The specifications below were acquired from several publications provided by Eastman Kodak Company and can be used as guidelines.

Of all the reasons for film to deteriorate, temperature and humidity have the most cause and effect. Therefore, a room designed to control these two aspects, at the very least, would improve the longevity of a microfilm collection.

There are also companies that offer modular room construction and additional guidelines.

Location and Fire Rating

The room should be on the 1st floor or an upper floor if the flooring and overhead support is adequate for the film cabinet weight and to prevent other floors from crashing into the room during a fire. The room should be constructed to be a 4 to 6-hour fire-resistive area under the Fire Underwriters' regulations (U.S.A.).

It should not be located in a basement or where humidity could be a problem. It should be located so it is not subject to water damage of any type. For instance, it should not be under water pipes or water heaters that could leak into the room.

Size of Room

Several assumptions must be made to determine the size of the room since the amount to store bears a direct relationship to the size. First, how many rolls of microfilm will be stored onsite in controlled storage? Acetate-based film should not be stored together with polyester film. However, acetate film may be stored in a controlled storage to slow the Vinegar Syndrome deterioration to allow more time for duplication efforts.

The first criterion is a room large enough to store all of the rolls of microfilm in the collection. As an example, consider a collection of 12,000 rolls of microfilm.

- This calls for space for 9 cabinet's total, in a rectangle-shaped room. This equates to a room 8 Ft. x 8 Ft. and allows space for a small table and a 3 Ft. aisle between the 2 rows. A typical microfilm closed cabinet is 23.5 inches wide and 28.5 inches deep. Add another 27.5 inches depth for an open drawer.
- The entry door to the room needs to accommodate a cabinet on a dolly. A 3 Ft. wide door should be an adequate width.

Condition and Control of Air

- The room must be kept under a slight positive pressure for ventilation and to prevent the entrance of untreated air. This means the introduction of fresh air that is filtered or scrubbed.
- A spray-chamber-type of air conditioner is probably best.
- Consider equipment constructed of corrosion-resistant, high-quality materials to prevent breakdowns and costly repairs.
- Ideally, the conditioner should be located outside the room for ease of

- maintenance and to prevent water leakage into the room.
- The conditioner housing and all duct work should be well insulated.
 - Control of temperature and humidity calls for appropriate instruments, such as a dry- or wet-bulb thermostat, hydrostat, or dew-point controller.
 - A temperature of 65 degrees Fahrenheit and humidity constant to 20% would be optimum. However, if cost is prohibitive...
 - Relative humidity should be kept between 20% and 30%
 - Temperature must not exceed 70 degrees Fahrenheit.
 - Since the room needs to be kept at a constant temperature, it should not have windows.
 - Dehumidifiers that use desiccants should be avoided. They can create a danger of fine dust particles getting on the film. These particles can cause abrasions on the film when it is used. Some chemical-desiccant particles can form bleached spots on film.
 - Use Underwriters' approved automatic fire-control dampers in ducts, installed in accordance with recommendations of the National Fire Protection Association.
 - An automatic sprinkler system inside a fire-resistive room containing only safety film is not necessary. Its elimination decreases the danger of accidental water damage. (See local building codes plus the Fire Underwriters' and National Fire Protection Association's regulations concerning valuable record rooms.
 - Filter the air to the room to eliminate dust. If there is atmospheric contamination in the locale, and environmental engineer should be consulted to help select the appropriate type of air scrubber or other air purification equipment as needed.

Other Specifications

- No combustibles are allowed in this room. Only metal cabinets, tables, film boxes, etc. should be used. Alternatively, plastic film boxes can be used. Carpet should not be on the floor.
- Sufficient wall insulation should be provided that also has a suitable vapor seal to permit satisfactory temperature control during all seasons of the year and to prevent moisture condensation on, or within, the walls.

- The room should be cleaned daily to prevent accumulation of lint from clothing, dirt from shoes, etc.
- If a spray-chamber is used in the air conditioner, and the water is recirculated, clean the chamber to prevent formation of biological slime. This slime will eventually decompose and give off hydrogen sulfide, one of film's chemical enemies.
- Air purification units also require occasional servicing.
- Precautions should be taken when the conditioning equipment is turned off for maintenance and repairs.
- Even with controlled conditions, stable film should still be inspected at least every two years. Acetate will need to be monitored more often.

Further considerations

- These specifications will lead to a sound storage option for irreplaceable film. After the acetate film has been safely duplicated onto polyester film, the room would become available for other film, optical or electronic media storage in the future.
- If this option is desired, the room size may be adjusted to suit the future needs as well.

Ideas to include in RFP/Bid Specifications

- Add 30" of leader and trailer to each reel of finished microfilm
- If microfilm masters need to be cleaned, the procedure must be manual
- Perform splice repairs where necessary
- Duplication and processing of the film must be done on state of the art duplicators and processors
- Film must be stored in an environmentally controlled vault in a secured facility with state of the art fire suppression technology
- Each roll of microfilm must be stored in an acid and lignin free film box and labeled appropriately
- Each roll will be inspected prior to return
- Each microfilm box must include a molecular sieve denoted with insertion date
- Lab is an Authorized Kodak Processing Lab and/or a Kodak Document Conversion Center
- Lab must provide process control data from Kodak
- No charge for Brown Toning
- Lab employees must have attended the Kodak Reliable Image Training and received certificates of completion after passing the Reliable Image test