

We have inspected many “archive storage vaults” over the years and have observed some reoccurring problems and misunderstandings that impact the vital records being stored there. Below are some of my observations and suggestions that I hope you will implement and share with others to ensure your important long term information will last.

ANSI/AIIM MS48-1990 7.1 Criteria for Using Microfilm Copies of permanent Records: The original camera negative microform copy of records created for permanent retention shall never be used for reference purposes. Original microfilm of permanent records shall be stored in a fire-resistant vault, room, or storage facility.

A limited number of working copies can be made from the original camera negative for reference purposes. These copies are usually produced onto non-silver duplicating films such as diazo or vesicular and sometimes even silver duplicating films. Unfortunately, many customers are using the camera original as their working copy and storing their working copies in archival storage locations. This is wrong, if you are practicing this concept you need to rectify this procedure immediately.



What are airborne oxidants?

ANSI/AIIM MS23-1998 15.4 Pollutants: A category of pollutants referred to as oxidants has been identified as the chief cause of microblemish formation (redox) on silver microfilm. The following is a partial list of some common sources.

- *Ozone from office copiers*
- *Fresh oil-based paints*
- *Cleaning supplies*
- *Construction adhesives*
- *Cosmetics*
- *Engine exhaust fumes*
- *Deteriorating paper*
- *Poor-quality cellulose products, (including acetate based films with vinegar syndrome)*
- *Tape*
- *Rubber bands*
- *Inks*
- *Glues*
- *textiles*

Long Term Storage Conditions and Considerations

ANSI/AIIM MS48-1990 8.4 Storage Area Environmental Conditions: The relative humidity shall not exceed 40 percent. Temperatures shall not exceed 70° F. Rapid and wide range cycling of humidity or temperature shall in no instance fluctuate more than 5 percent RH or 5° F in a 24-hour period.

ANSI/AIIM MS23-1998 15.6 Intermixing Film Types: Effects of intermixing is quite varied. However, signs such as change in the color of the emulsion surface, presence of microblemishes, and bleaching and lightening of the silver image can be noted. Films such as diazo and vesicular should not be placed in the same filing cabinets as silver based films.

ANSI/AIIM MS23-1998 16 Inspection of Stored Film: When microfilm masters/originals are not occasionally inspected, chemical deterioration could be taking place. Therefore, it is prudent to establish an ongoing inspection procedure to determine if the microfilm is degrading in any way. An annual **inspection of the microfilm can determine if there is any degradation and the need for re-filming of any segments or duplication of rolls. The inspection may be simply to determine if the storage conditions should be improved to slow any deterioration present.**

Below are some typical problems found in Long Term Storage Areas

- Under rated HVAC systems
- HVAC filters not changed regularly (should be replaced monthly)
- Microfilm boxes improperly stored in non-approved enclosures (cardboard, wood, metal and plastics)
- Microfilm rolls stored in non-acid and lignin free boxes
- If the microfilm box does not state it is “Acid & Lignin Free” you must assume it is not. **If a vendor tells you they are, request that they provide a letter of certification to that affect.**
- Improper temperature and humidity settings and fluctuation of these settings
- Plywood paneled walls
- No room air exchange
- No positive air pressure
- Carpeting on the floors
- Freshly painted walls without removing the microfilm collection
- Contaminated microfilm stored in same cabinets and, same drawers with newly imaged microfilm
- Diazo microfilm in same drawer as silver microfilm
- Microfilming cabinets not elevated 6 inches off floor surface
- Dirty environments (floors, walls, cabinet tops, cabinet interiors)
- Evidence of insect and mice droppings
- Fungal growth on reels, film enclosures, walls, and floors
- No fire protection system in place

- Improperly trained personnel working in area
 - Not employing molecular sieves in each roll of microfilm
 - Microfilm not treated with a polysulfide solution such as Kodak Brown Toner
 - Non-Silver duplicates stored instead of original masters. Original masters being used as reference copies.
- [ISO 18911:2000\(E\) 7 Environmental conditions:](#)
 - *7.1 Temperature and humidity specifications for storage (see annexes E, F, and G)*
 - *7.1.1 Recommended temperature and relative humidity*
 - *The recommended temperature and relative humidity conditions given in Table 1 shall be maintained either within individual storage housings or within storage rooms containing such housings.*
 - *Table 1 — Maximum temperatures and relative humidity ranges for extended-term storage*

Image	Base	Maximum temperature ^{a, b} °C	Relative humidity range ^{a, c} %
Black-and-white silver-gelatin ^d (see ISO 10602)	Cellulose esters ^e	2	20-50
		5	20-40
		7	20-30
Black-and-white silver-gelatin ^d (see ISO 10602) Thermally or processed silver (see ISO 18919) Vesicular (see ISO 9718) Silver dye bleach	Polyester	21	20-50
Colour (chromogenic)	Cellulose esters ^e	- 10 - 3	20-50 20-40
Diazo (see ISO 8225)	Polyester	2	20-30

^a See annex H for storage of historic still photographic records.

^b Cycling of temperature shall not be greater than ± 2 °C over a 24 h period.

^c Cycling of relative humidity shall not be greater than ± 5 % RH over a 24 h period.

^d If there is concern about the possibility of silver image oxidation due to atmospheric contaminants, poor quality enclosures, and/or excessively high temperature and humidity levels, a post-process chemical conversion treatment can be used to provide added protection (see ISO 18915).

^e This includes cellulose triacetate, cellulose acetate butyrate, and cellulose acetate propionate.