Introduction to Micrographics

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Introduction

Before undertaking a microfilming project, a local government official must learn some microfilming basics. This does not mean the local official needs to become a technical expert! Knowledge of the fundamentals of microfilming allows the local official to work efficiently with vendors and will ensure a quality product. The following publication briefly introduces some microfilming concepts, terms, and equipment. A glossary of microfilm terms can be found at the end of this publication.

This publication is one of three microfilm publications in the Local Government Records Technical Information Series. Technical standards are discussed in *Producing High Quality Microfilm* (Technical Information Series #9), and project management is discussed in *Managing Micrographics Projects* (Technical Information Series #10)[Replaced by Publication #77].

Microfilm is fine grain, high-resolution photographic film capable of recording images. It was developed at the turn of the century and was refined and used heavily during World War II. This mature document technology continues to evolve and currently is seeing a resurgence as a component of many hybrid imaging systems.

The process of actually putting the image on film is relatively easy. A camera takes a picture of a document. The camera negative is developed and duplicated. The film is viewed on a reader that magnifies the image. However, to produce quality microfilm that is readable, properly identified, easily accessible, and meets the technical standards is not a simple process. Local government officials must be prepared to spend time during the entire process, from selection and preparation of the records to be filmed, through the final inspection and distribution of the microfilm.

When Do You Microfilm?: Micrographics & The Life Cycle of Records

After choosing an appropriate record series for microfilming, staff must decide when to microfilm. The choices are to microfilm at the beginning of the life cycle (soon after the creation of the record); to microfilm when the records are no longer used on a regular basis (usually when records are sent to inactive storage); or to microfilm the records as they approach the end of their life cycle and are evaluated for permanent retention or possible destruction. The following paragraphs discuss general guidelines that can be applied to most projects.

Microfilming at Beginning of Life Cycle

Occasionally it makes sense to microfilm records soon after the records are created This situation may apply if there are large quantities of records that need to be referenced often at multiple locations. Under these conditions, it may be cheaper and easier to produce microfilm rather than paper particularly if computer output microfilm is a viable option.

- Highly active records

  By highly active, we mean a record series that is referenced daily such as New York City parking tickets. Though any individual ticket is rarely retrieved, each roll of more than 10,000 tickets is in constant use for about three months and then usage falls off as most tickets are paid.

- Records requiring distribution of multiple copies

  Often a record is needed at multiple locations or needs to be distributed to the public or to other local government offices. Building department files are referenced by plan examiners, architects, contractors, property owners, tenants, and other interested parties from the local government staff and the public. Having microfilm copies of such records makes distribution easy and inexpensive.

- Records produced using computer output microfilm (COM)

COM completely skips the paper step and goes directly from a digital computer file to microfilm. This makes it an ideal, low cost method for distributing these digital files. Payroll and timekeeping records are often produced using COM.

Microfilming When Records Become Inactive

Many record series need to be retained permanently or for many years but receive little active use after a few years and these records are good candidates for microfilming. Typical examples include election signature cards and student records.

Records with a retention period of more than ten to fifteen years can be stored less expensively on microfilm than on paper. Conversely, at a price of at least $100 per roll, it does not make economic sense to microfilm lightly used records with a life span less than 10 years.

Microfilming at the End of the Life Cycle

- Records Identified as Permanent

  The New York State Archives, other state agencies, or internal records schedules identify records series with permanent retention. Sometimes records are identified as permanent during analysis of inventory sheets. These records are good candidates for microfilming as storage space can be greatly reduced and vital records can be protected.

- Records With Historical or Research Value

  Records with research value are good candidates for microfilming. For some records research value may be obvious, but for other records it may take a careful review of the records. Evaluating potential research value is an important part of caring for records and should be considered for all records before destruction. Local Governments officials evaluating research value of records may want to attend State Archives archival workshops and refer to Technical Information Series #50 titled, *Appraisal of Local Government Records for Historical Value.*

Before deciding when to begin microfilming, contemplate the needs of the records, the local government, and the public. Consider efficiency, security and total costs.

Microfilm Formatting Issues

The format of the camera negative and the copies distributed for use is dependent upon several factors. Some of these factors include:

- Microfilm size
- Document size
- File activity
- Distribution needs
- Production costs

- Image orientation
- Film thickness

Document Size & Film Format

The larger the document the more times it will need to be reduced to fit on the microfilm. This ratio is expressed in numerical value. For example, a 32X reduction means that the image of the film is 32 times smaller than the original document. The reduction ratio is a function of the document size and proportions and the film size. As the reduction ratio is increased, the quality of the microfilm is decreased. **Consequently, each records series needs to be evaluated to determine what is the lowest reduction ratio practical for any given series of records.**

Microfilm comes in three widths noted below. Most local government applications will involve 16 mm or 35mm roll film. As an informal guideline, letter or legal size records can be filmed on 16mm film. Larger size documents generally require the 35mm format. Records microfilmed in the 16mm format usually do not exceed 11" x 14" with a 32X reduction.

The 35mm microfilm format is generally used for documents larger than 11" x 14" and for bound documents up to 24" x 36" with a 24X reduction. This format is also used for architectural, engineering, and topographical drawings not exceeding 36" x 48.6" with a 30X reduction.

The 105mm microfilm format is used to produce original microfiche often in the form of COM (computer output to microfiche).

Film thickness

Microfilm can be 2.5 to 7 mils thick. Five mils is the industry standard. The thickness of the microfilm determines the strength and the number of images on each roll. A 16mm, 215 foot, 2.5 mil roll of microfilm contains about 5,000 images. A standard 16mm 5 mil, 100 foot roll contains 2000-2500 images. A standard 100 foot, 35mm roll film is 5 mils thick and records up to 1,000 images.

Image orientation

Records can be filmed in either a "comic" or a "cine" mode. In the comic mode records are arranged on film from left to right like a comic strip. In cine mode images are arranged with bottom of one image above the top of the next as on movie film.

Image orientation is usually dependent upon the size and proportions of the documents. Horizontal images would tend to be filmed in comic mode. In the 16 mm mode, comic mode allows for the most images per roll of microfilm.

Distribution format

The use copies of microfilm are referred to as the "distribution" copies. These copies can be distributed in a variety of formats as discussed below.

- Open roll

  Open roll is a continuous length of microfilm wound around a spool. This form is the least expensive to create, easy to distribute, and is used because a large amount of information can be stored on one roll. Also, roll film is commonly used for storage of the master negative. File integrity can be guaranteed in the roll format as it is impossible to alter the film without creating a visible splice. Therefore roll film format is ideal for records that may be involved in legal or administrative proceedings.

- Cartridge

  A cartridge is a roll of microfilm placed in a special plastic case. This form requires special retrieval equipment but does protect the microfilm from dust and fingerprints. Cartridges can be quickly loaded into a computer-assisted retrieval system (CAR). Many of these systems automatically advance the film to the document that needs to be referenced.

- Aperture cards

  Aperture cards are cards in which a rectangular window has been cut and frames of microfilm are placed. Aperture cards are most commonly used for large engineering drawings. To insure the legality and the longevity of the microfilmed records, the camera negative (silver gelatin master) should be maintained in a roll format and stored off-site under strict environmental controls.

- Microfiche

  Microfiche (105mm) is produced using a step and repeat camera or from Computer Output Microfiche (COM).

- Jacketed microfiche

  Jacketed microfiche is 16mm or 35mm film strips that are sleeved in polyester jackets. Usually one jacket can contain up to 60 images. There is a space at the top of the jacket for indexing that enhances retrieval. This form can be updated as new records are created. The equipment used for retrieval is relatively inexpensive but jacketing microfilm is expensive because of the time it takes to cut and sleeve the microfilm. **Never jacket silver gelatin master negatives.** Using jackets compromises the file integrity because film can be removed from the sleeves. Often, inexpensive duplicate microfiche are made for distribution from the jacked microfilm.

  Because of the significant labor and materials costs associated with jacketing microfilm, use of this format should be given careful scrutiny. Jackets can be used to merge both 16 and 35 mm formats to allow better access to complex record series. For example, a building department file can have the plans put into 35mm jackets and the associated letter/legal size documents put into 16mm jackets, and then have the two types interfiled.

This gives the benefits of both formats, but is the most expensive way to microfilm. Sometimes microfiche are used to mange case files such as student files, a building file, or personnel records. A simple index printed on the top line of the microfiche provides efficient access to the records. Microfiche can be read using inexpensive readers.

Before deciding which microfilm format to use, review several questions. Why are the records being filmed? How often are records retrieved and how quickly is information needed? Will there be a need to make hard copies frequently? Are files to be updated?

Types of Microfilm

There are several types of microfilm, and it is important to use the appropriate type of film for each microfilm project as outlined below.

Silver gelatin master negative

- Is the original camera negative.
- Is used to microfilm records with permanent retention.
- **Never serves as a use copy.**
- Is the security archival copy.
- Is maintained off-site in a humidity and temperature-controlled environment.

Duplicating film (diazo or vesicular)

- Diazo duplicates are inexpensive and durable. Usually they will last 50 to 100 years.
- Diazo duplicates have a minimal loss of image quality resulting from the duplication process.
- Vesicular duplicates are preferred by some because they are created without the created without the use of chemicals. However, vesicular duplicates have more image loss and are not as strong as diazo duplicates.

Do not store master and duplicate film together. Chemical migration from duplicate film will shorten the life of original microfilm.

Types and Uses of Cameras

When selecting a microfilm vendor, it is a good idea to know what type of equipment the service bureau uses. This information will give the local government an indication of the vendor's ability to produce duplicates as well as the vendor's ability to produce quality microfilm with the proper camera. Three types of cameras are used to microfilm records: planetary, rotary, and step and repeat.

Planetary cameras

- Filming is done by placing the document on the flat copy board.
- Films documents up to 45 inches wide

- Produces both 16mm and 35mm microfilm
- Required for filming of archival records.
- Required to film brittle and fragile documents.
- Used to film bound volumes.
- Produces higher quality microfilm than rotary cameras.

Rotary Cameras

- Film and documents are both in motion during microfilming, producing minimal quality images.
- Films documents of uniform size up to 12 inches width.
- Produces only 16mm microfilm.
- Used mostly to film large quantities of records with short retentions.
- **Never** used to film fragile and/or archival documents
- Not recommended for filming permanent records.

Step and Repeat cameras

These planetary cameras produce 105mm microfiche. Only large vendors have such expensive cameras that are often are used for filming a large volume of case files.

Retrieval Equipment

After determining what record series to microfilm, decide how to make the information available in a convenient format. The microfilm size, the type of microform, and user needs, will determine the retrieval equipment needed. If the information is needed in more than one area of the local government, multiple retrieval stations may be necessary. Types of retrieval systems are outlined below.

Microfilm/Microfiche Readers

- Used when only a reading capability is needed.
- Least expensive of retrieval systems.
- Models are available to read only roll film, only microfiche or read both roll and microfiche.
- Models are available to read both 16mm and 35mm microfilm.

Microfilm/Microfiche Reader/Printers

- Used when plain paper hard copies are needed.
- Models are available to read both roll microfilm and microfiche.
- Models are available to read both 16mm and 35mm microfilm.
- Some models produce several size prints.

Microfilm Reader/Printer Lens

The choice of a lens for a reader/printer will be dependent upon microfilm format, either 16 or 35 mm, and the reduction ratio. A zoom lens or several lenses may be required to accommodate several microfilm applications. Blowing documents back up to original size usually makes for the most comfortable reading of the records.

Computer Assisted Retrieval Systems (CAR)

Many local governments use computer assisted retrieval systems, commonly referred to as "CAR" systems, to quickly access microfilmed records. A fully automated CAR system requires the use of 16mm film housed in cartridges. CAR systems are often developed for large records series that need to be accessed often such as case records, personnel records, or student records. These systems index and retrieve information contained on microfilm through the use of databases that pinpoint information quickly by a keyword, surname, or unique number. Accurate data input for the database index is vital.

Blipping

Blips are opaque marks placed on the microfilm by the camera to mark each one of the several thousand exposures on a roll of 16mm film. Many readers or reader-printers read the blips and wind the film to the exact document that needs to be viewed. This is a great convenience and also reduces retrieval time. Usually there is no charge for placing these blips on the film. Therefore, it is worthwhile to have them even if there is no immediate need to automate retrieval.

Frame Numbering

Most 16mm cameras place a frame number next to each image on the microfilm. Often local governments develop databases to link frame numbers, roll numbers, and file name, social security number, surname or other unique information. Sometimes these projects are completed using previously purchased general database software. This improves access without expending resources for CAR hardware and software, but does not provide complete automated retrieval of records.

Use CAR systems when:

- The records are accessed many times each day, i.e. student transcripts.
- A large number of records are referenced daily, i.e. deeds.
- Rapid retrieval of records is critical, i.e. court records.

Before Purchasing Equipment

Discuss current and planned microfilm projects with vendors, other local officials, and your State Archives Regional Advisory Officer before purchasing any microfilm equipment. Ask vendors about service contracts and service call costs. The insights gained can often prevent a costly mistake.

Document Preparation

Document preparation is often the most important and time-consuming activities in the microfilming process. Decisions regarding document preparation must be made at the beginning of any project because both the local government and the vendor usually undertake portions of document preparation. The cost for a project can rise significantly if a vendor undertakes a major portion of the document preparation. Vendor preparation requirements must be carefully written for each record series being microfilmed and these requirements should be clearly spelled out in each project specification. This prevents misunderstandings during the project. Preparation costs should be quoted as a cost per frame. Some vendors quote an hourly rate for document preparation and if a project is complex cost overruns can be significant.

Several issues must be addressed when reviewing document preparation concerns. Two key issues are security and access. Do the records contain confidential information and what procedures does the vendor have in place to guarantee the confidentially of the records once they leave the local government facility? Can the records be removed from the premises? Some records are so active or the security issues so sensitive that records must be filmed on site. This adds significant costs to a project and in most cases this is an unnecessary expense.

Other basic areas of document preparation include:

- File Organization

  How is the record series arranged? Usually records are filmed in the order that was maintained in the office creating and/or maintaining the records. If there is an index to the record series it should be filmed with the records. When there is no usable order to the records, the local government staff establishes a new arrangement. This task is left to the local government staff because they know the records better than the vendor and local officials have the legal responsibility to manage the records. When verifying the records for order and completeness, the staff should insert targets, identifying problems such as missing pages, faded documents, and damaged documents.

- Purging of Unneeded Documents

  Purging unnecessary documents, using the appropriate records retention schedule, can dramatically reduce the cost of a microfilm project. As local government staffs examine files, duplicate records may be found that can be discarded. Also, there is a tendency to shove items into files that have nothing to do with official records and these items should be purged. If a record series is well organized and only a few duplicates are found, it is less expensive to film all the records than pay a staff member to look for the occasional duplicate. Also, it may not be worthwhile to purge small record series. When staff is not available to do the purging, using former employees who are familiar with the records may be an option. Purging of records is almost always undertaken by the local government. The local government has the legal responsibility to maintain the records, and staff is familiar with the records. Local government staff is careful when they undertake document preparation as they have a vested interest in preservation of the records. Sometimes vendors' staffs do not exhibit the same care for the records.

- Removal of Fasteners

  The removal of fasteners is usually done by the vendor and should be a part of any specification. This includes the removal of paper clips, staples, rubber bands, and any other items attached to the records.

- Disbinding

  The disbinding of bound volumes is usually left to the vendor. Where the binding can be easily disengaged, i.e., post binding, etc., this is no problem, but in the case of sewn and glued bindings the actual cutting of the binding may be needed. Many vendors "guillotine" bound volumes and the process destroys the binding. This process is not appropriate if the volume is to be retained for its historic or artistic value. If the volume can be disbound, there is less labor involved in handling and the pages will lie flat. This reduces filming costs and increases the quality of the microfilm. If the binding is to be cut, this should be stipulated in specification. Usually after the volumes are disbound in this manner, they are legally destroyed after microfilming.

- Repair Torn Documents

  If non-archival documents are scheduled for destruction after filming, then they may be repaired by using tape on the reverse side if the documents. **Archival documents should only be repaired by a trained conservator.**

- Flattening of Folded or Rolled Documents

  Folded or rolled documents usually need flattening before microfilming. This is often done by the application of weight and pressure to the documents. Consult a conservator if fragile documents will be retained after microfilming. Local governments sometimes undertake this activity to reduce project costs; however, adequate workspace must be available to flatten documents efficiently.

- Targeting

  The use of appropriate targets is an essential. Targets are used in the production of microfilm to certify that the information is accurate, to identify the contents of each roll of film, and to verify that the film has met minimum quality control standards. Specific targets are placed at the beginning and the end of each roll. Several different kinds of targets are used in the production of quality microfilm. Administrative targets, such as the certification target, verify that the film is an accurate reproduction of genuine local government records. Informational targets, such as the roll number, start, title, defect, and end targets, provide readers with critical information. Correctional targets identify and correct errors in the microfilm. Technical targets, such as the resolution and density targets are used to monitor the quality of the microfilm.

Using the standard sample targets found at the end Technical Information Series #10, *Managing Micrographics Projects* [Replaced by Publication #77], and following the practices outlined in this publication will satisfy all legal and technical requirements regarding targeting. Also, the appropriate use of targets will make the microfilm easy to use!

Certification

Often, microfilmed records are submitted for use in legal or administrative proceedings in place of original records. When this takes place the certification of the information on the film should establish that the records were filmed during the regular course of business. The certification establishes the time the records were filmed, and identifies the camera operator in case testimony or a disposition is needed.

Certification by Camera Operator Target

This target must be used and completed by the camera operator and the target contains the following: the full name and address of the local government, the contractor's name and address, the record series title, the beginning of the record series, the end of the record series, the date filmed, the reduction ratio, printed name of camera operator, and signature of the camera operator. Ideally this certification would also include the film manufacturer, type of film, the expiration date of the film, and batch film number.

The Certification by Camera Operator target is placed on the roll of microfilm in the beginning targeting sequence and at the end of roll targeting sequence. On the target placed at the front of the roll the camera operator records the beginning point of his or her filming for the particular roll of film. On the target placed at the end of roll, the camera operator enters both the beginning and the ending points for the records microfilmed.

Samples of record series information that would typically appear on a camera operator target follow.

Alphabetical Arrangement

Before Filming Records	**After Filming Series**
Record Series Title: Student Records	Record Series Title: Student Records
Roll Begins With: Aaron, A. A.	Roll Begins With: Aaron, A. A.
Roll Ends With: Not Applicable	Roll Ends With: Zyem, Z. Z.

Chronological Arrangement

Before Filming Records	**After Filming Series**
Record Series Title: Minutes	Record Series Title: Minutes
Roll Begins With: February 1, 1944	Roll Begins With: February 1, 1944
Roll Ends With: Not Applicable	Roll Ends With: March 28, 1981

Numerical Arrangement

Before Filming Records	**After Filming Series**
Record Series Title: Case Files	Record Series Title: Case Files
Roll Begins With: Case # 3012	Roll Begins With: Case #3012
Roll Ends With: Not Applicable	Roll Ends With: Case #4302

Declaration by the Records Custodian

When microfilm will be used in a legal or administrative proceeding, this target must be used and completed by the person who has legal custody of the records. A Declaration by the Records Custodian Target is created for each record series to be microfilmed. The declaration normally contains the following: the local government's name; units within the local government if applicable; the record series title; the arrangement of the record series, the identification of the beginning document; and any restrictions on the use of the microfilm.

Informational Targets

Eye readable information targets, such as a start target, roll number target, a title target, end target, etc. allow staff to identify film in case film gets misfiled or separated from its box. Also, the large lettering on eye-legible targets makes them much more noticeable and easy to find when the film is being viewed on a reader.

Defect targets point out problems such as missing pages or blank pages that were intentionally not microfilmed. Usually governments insert these targets when records are being "prepped" for microfilming. Sample defect targets are found at the end of Technical Information Series #10, *Managing Micrographic Projects* [Replaced by Publication #77].

Correctional targets are informational targets used for retakes. Retakes are necessary when a filming error, such as poor density in a few frames or shadows in the frame, has been found during the quality control check. The problem frames are then refilmed correctly on another roll and then those frames are spliced into the clear leader at the front of the original roll of microfilm. To retain the **legal authenticity of the microfilm splicing is only permitted in the clear leader at the front of the roll of microfilm.** Also, having the errors at the front of the film alerts the reader to the problem. If excessive errors are found, the roll of film will need to be raced in accordance with the specification.

When microfilming a record series, all indexes and finding aids for the original records should be filmed and targeted appropriately. When producing a finding aid for a roll of film the information should be consistent with the target information on the film. Before filming, each target should be inserted in the proper place in the original records and filmed in that sequence. All targets should be filmed before and face the same direction as the documents to which they are related.

The following targets are essential to ensure the authenticity and ease of use of any microfilm:

- **Start Target**. **START** should be printed so it is eye-legible without magnification.
- **Roll Number Target**. **ROLL NUMBER** should be printed so it is eye-legible without magnification. When indexing roll microfilm, this number is incorporated into the index.
- **Record Series Title Target**. **TITLE TARGET** should be printed so it is eye-legible without magnification. This target may contain the name of the local government, the title of the record series, and the record series arrangement.
- **Restriction Specification Target**. When applicable, any restrictions on access or use, including further reproduction should be specified. The source of the restrictions should be specified. If there are time limits on the restrictions, clearly state the ending date.
- **Start File**. **START FILE** should be printed so it is eye-legible without magnification. This will be used to separate individual existing folders when specified by the local government.
- **End Target**. **END** should be printed so it is eye-legible without magnification.
- **Defect Targets.** These indicate defects in the records being filmed and should be used appropriately. Examples are: **DAMAGED DOCUMENT, MISSING DOCUMENT, POOR QUALITY DOCUMENT, FADED DOCUMENT, etc**. These should be printed so they are eye-legible without magnification and placed on the film immediately before the documents to which they relate.
- **Start Retake**. **START RETAKE** should be printed so it is eye-legible without magnification. This should be placed at the beginning of any refilming that is necessary. Retakes are to be spliced into the clear leader at the beginning of the roll.
- **End Retake**. **END RETAKE** should be printed so it is eye-legible without magnification. This should be placed after any refilming that is necessary. Retakes are to be spliced into the clear leader at the beginning of the roll.

Quality Control Targets

Quality Control targets are used to test the resolution and density of the microfilm. Also, documentation of testing for removal of chemical residues is included in the targeting sequence.

Density Target. This target is used to read the microfilm's density with a calibrated instrument know as a densitometer. The instrument measures the contrast between the image and non-image portions of the microfilm. Microfilm has similar properties to other film. If you develop a roll of your pictures and your negatives are very light the prints made from these negatives will appear washed out. On the other hand, if your negatives are very dark the prints made from these negatives will lose detail. If a local government is filming difficult images such as penciled images on yellowed paper or red ink on red paper there will be difficulty recording the images with the proper density. Sometimes a file will have documents that are so faded and of such low contrast that densities below those given in the guidelines are required to obtain a legible image. Local officials will want to discuss microfilming of difficult records with their RAO and their vendor.

The optimum density target is a full-frame image, using blank paper that matches the record in color. Every effort should be made to use a blank sheet from the actual records, but in the event this is not available, a clean, blank color-matched 20-pound bond sheet may be substituted.

Splicing this target on the roll is forbidden. This target will be placed at the beginning and end of the roll of film.

Resolution Target. Must comply with standard ANSI/AIIM MS51 published by American Nations Standards Institute. Photocopies of this target cannot be used. This target is placed at the beginning of roll targeting sequence and at the end of roll targeting sequence. The image of the resolution target is read through a 100X microscope after filming and recorded as a numerical value. The microfilm vendor supplies this target.

Residual Thiosulfate Test Certificate. A certificate verifying that residual thiosulfate testing has been performed by an independent micrographics laboratory is microfilmed on each roll of film. The certificate can precede the filming date by a maximum of two weeks (one week preferred). This test is often referred to as the "Methylene Blue" test. All quality microfilm vendors routinely have this test performed as a normal part of their operations and filming the test certificate on each roll of film will not cause a burden for the vendor. This test verifies that microfilm has been properly washed and that there are minimum chemical residues left after film has been processed.

Summary & Conclusion--Producing Quality Microfilm

When beginning a microfilming project, the local government should be aware that the quality of the end product will often be determined by the amount and quality of time spent supervising a project. Quality control not only includes the technical issues of resolution, density and reduction ratio but extends to every aspect of the project. Comprehensive quality control also includes the selection of proper records for microfilming, adequate document preparation, selection of the proper film format, adequate targeting and proper processing, inspection, storage, and retrieval of records.

What is high quality microfilm? High quality microfilm:

- accurately reflects the original,
- is identified correctly,
- has been tested for residual thiosulfate,
- has not been spliced within the record series,
- has passed minimum resolution and density requirements,
- has been inspected by a third party microfilm lab,
- has been inspected by the local government staff to ensure what has been filmed is the same as the original,
- has the original camera negative stored off-site under in an environmentally controlled facility?
- has user copies available for quick retrieval.

This publication has introduced microfilm concepts, equipment, and terminology. It is one of three Technical Information Series microfilm publications. After reviewing this publication local governments may want to look at microfilm project management issues outlined in Technical Information Series #10, *Managing Micrographics Projects* [Replaced by Publication #77] or

review the technical guidelines found in Technical Information Series #9, *Producing Quality Microfilm*.

For More Information & Assistance

There are many additional resources available to local officials to broaden their knowledge of microfilm. Here are a few suggestions:

- Consult with other local government staff who have completed successful microfilming projects.
- Consult with knowledgeable vendors.
- Attend New York State Archives microfilming workshop:

"Micrographics as a Records Management Tool"

- View *Look Before You Leap,* the State Archives' microfilm training video, which walks the audience through a typical micrographics laboratory.
- Review State Archives, ARMA, and the Association for Information and Image Management (AIIM), and other organizations' micrographics publications.
- Purchase *Using Microfilm: A Guide for Local Governments*, available from the National Association of Government Archives and Records Administrators, 48 Howard Street, Albany, New York, 12207. This booklet costs just a few dollars and gives a good overview of micrographics.

If local governments are microfilming court records they should contact the Micrographics Coordinator, Office of Court Administration, Office of Reference Services, Agency Bldg. 4-10th Floor, Empire State Plaza, Albany, NY 12223. The staff will aid local governments in developing specifications for court records.

The New York State Archives provides records management services to local governments including technical advice and assistance, publications, training and presentations, and consultations with local governments concerning records and information management issues. The State Archives has regional offices throughout the State; each office has an experienced records specialist who can visit local governments and provide on-the-spot advice. These services are supported by the Local Government Records Management Improvement Fund. For further information, contact your regional office or the following:

Government Records Services
New York State Archives
State Education Department
9A47 Cultural Education Center
Albany, New York 12230
(518) 474-6926

A Glossary of Commonly Used Microfilm Terms

16mm microfilm -- microfilm which is 16mm in width, commonly used to film office documents up to 8 1/2 by 14 inches.

35mm microfilm -- microfilm which is 35mm in width, commonly used to film documents larger than 8 ½ by 14 inches and often used to film archival records.

Aperture card -- a card with a rectangular hole or holes specifically designed to hold a frame or frames of microfilm. Often used to store frequently accessed large format documents such as building plans.

Base -- polyester layer upon which the film emulsion is embedded.

Blips -- are opaque marks placed on the microfilm by the camera to mark each one of the several thousand exposures on a roll of 16mm film.

Book cradle -- equipment used to microfilm bound volumes. The cradle flattens pages to increase sharpness and reduce shadows during filming.

Camera negative -- microfilm used in a camera to produce original roll of microfilm. For permanent records the camera negative must have a silver gelatin emulsion to ensure longevity of the film. To minimize damage to the microfilm, the camera negative **is only** used to produce user copies of the microfilm.

Car -- computer assisted retrieval systems. An automated system that uses a database in conjunction with reading "blip" marks on each frame of 16mm microfilm to speed retrieval of documents on microfilm.

Cartridge -- is a roll of microfilm placed in a special plastic case. This form requires special retrieval equipment but does protect the microfilm from dust and fingerprints. Microfilm used in CAR systems are housed in cartridges.

Certification -- process by which the camera operator and the records custodian document that the microfilm reflects true copies of the records. Following set certification procedures ensures microfilm will be admissible in court or administrative proceedings.

Cine mode -- images arranged on microfilm with bottom of one image above the top of the next (like movie film).

COM -- computer output microfilm. Microfilm produced directly from a computer file to microfilm. COM produces high quality microfilm, often in microfiche format.

Comic mode -- images arranged on film from left to right like a comic strip.

Density -- measures the **contrast** between the image and the non-image background of the film.

Diazo microfilm -- microfilm used to create user copies of microfilm. This film is ideal for everyday use because of its strength and high quality image. This film has an average life expectancy of 50 years.

Document preparation -- activities that must be undertaken to prepare records for filming. Activities include **physical preparation** such as removing staples, unfolding etc. and **intellectual preparation** which includes placing records in the correct order, purging records when appropriate, producing indexes, etc.

Emulsion -- a light sensitive layer coated onto a film substrate. The microfilm images are recorded in the emulsion layer of the microfilm.

Frame numbering -- number placed by most 16mm cameras next to each image on the microfilm.

Jacketed microfiche -- is 16mm or 35mm film strips that are sleeved in polyester jackets containing three to eight sleeves.

Leader -- clear film 24 to 36 inches on the front and back of the roll of microfilm to protect the images on the film.

Methylene blue test -- SEE Residual Thiosulfate Test.

Microfiche -- a sheet of microfilm containing multiple images in a grid pattern.

Microfilm -- fine grain, high-resolution photographic film capable of recording images.

Microfilm / microfiche readers -- equipment used to read microforms and whose primary components include a lens, a light source, and a viewing screen. Microfilm is normally enlarged to original size for reading.

Microfilm / microfiche reader / printers -- equipment used to read and produce paper copies of documents from microfilm.

Micrographics -- science of recording images on microfilm.

Planetary cameras -- camera consisting of a camera head (with the film), lights, and a copy board. Documents are placed under the camera head and filmed while lying flat on the copy board.

Polarity -- microfilm has either a negative polarity (white lettering on a dark background) or a positive polarity (black lettering on a light background). Original camera film normally has a negative polarity.

Reduction ratio -- how may times a document is reduced in size during microfilming expressed as a numerical value. A reduction radio of 24X means the document was reduced 24 times during microfilming.

Residual thiosulfate test -- test used to measure chemical residue left on microfilm after processing.

Resolution -- measures the ability of the microfilm to record fine detail (sharpness of an image).

Resolution target -- target used to read resolution of each roll of microfilm. The target must comply with the American National Standards Institute standard published as ANSI/AIIM MS51.

Rotary camera -- a camera into which documents are fed and the documents and the film move simultaneously similarly to the way a photocopy machine operates. These cameras are used for high speed filming that produces low quality microfilm.

Serialized microforms -- microfilm where images are stored sequentially on a roll.

Specification -- a written document that details the technical requirements for a microfilming project.

Splice -- a joint made by welding two pieces of film together so they will function as a single piece when passing through a microfilm reader. Splicing is used to correct errors and should only be done in the clear leader at the beginning of the roll of film.

Target -- information microfilmed preceding or following documents to supply bibliographic or technical information.

Unitized microforms -- images are cut or created in units and are housed in jackets or are created as original microfiche. Often used in case file applications because each individual case file can be contained on one or more microfiche.

Vesicular microfilm -- microfilm used to create user copies of microfilm. This duplicating film is sometimes preferred because duplication process does not require the use of chemicals.