State of Michigan
Records Management Services
Best Practices for the Microfilming of Paper Records

1.0 Introduction

The Records Reproduction Act (MCL 24.401-24.406) regulates the reproduction of public records by Michigan government agencies at all levels. This law requires the Records Management Services (RMS) to promulgate technical standards to ensure the continued accessibility and usability of records that are microfilmed throughout their retention period. This document supplements the "Technical Standards for the Microfilming of Paper Records."

2.0 Scope

This document applies to the conversion of public records by any Michigan public body from paper to microfilm for the purpose of maintaining official records in a micrographic format. This document focuses primarily on the production of roll microfilm. However, many of the principles also apply to other micrographic formats. Standards cited in the bibliography of this document may clarify format specific requirements. If microfilm is produced by a third party, the state agency or local government is responsible for ensuring that the third party is in compliance with the standards.

3.0 Intent

This document is intended to assist state agencies and local governments ensure that the records they convert to microfilm formats are authentic, reliable, have integrity, and are usable. RMS is aware that there may be instances where a public body has a microfilm application, which, due to the nature of the application, might require the use of techniques that are not in compliance with these best practices and technical standards. It is not the intention of RMS to impose standards upon a public body that will reduce the intended benefits of the microfilm application. The ultimate goal is to ensure that the film be legible and accessible for its intended use.

In the event that significant deviations from the standards and best practices are warranted, the agency should contact RMS to develop technically acceptable alternatives that meet the needs of the agency without the risk of implementing a non-viable or non-compliant solution. In all other instances where deviations from the standards are not required or requested, it is in the best interest of the agency to follow the practices detailed in the best practices and technical standards.

Some microfilm formats and techniques may not be suitable for long-term retention. Issues that affect the permanent preservation of the records include, but may not be limited to: organization, indexing, format, resolution, and storage media. The Archives of Michigan will work with state agencies and local governments to identify those public records that are designated on an approved Retention and Disposal Schedule for transfer to the Archives for permanent preservation.

4.0 Basic Principles of Record Keeping

Selecting an appropriate record keeping system is like selecting the appropriate level of insurance for your home. Records with a greater value to the agency warrant a greater level of insurance. Records with lesser value "may" warrant a lesser level of insurance. Regardless of the value, all records and record keeping systems maintained by a state agency or local government must possess

four basic characteristics to be considered trustworthy. Records must be authentic, reliable, have integrity, and be usable regardless of the format and the media they are contained on.

An **authentic** record is one that can be proven to be what it professes to be, to have been created or sent by the person claiming to have created or sent it, and to have been created or sent at that time. To ensure the authenticity of records, state agencies and local governments should implement and document policies and procedures which control the creation, receipt, transmission, maintenance and disposition of records. This will ensure that record creators are authorized and identified, and that records are protected against unauthorized addition, deletion, alteration, use and concealment.

A **reliable** record is one whose contents can be trusted to be a full and accurate representation of the transactions, activities or facts to which they attest and can be depended upon in the course of subsequent transactions or activities. Records should be created at the time of the transaction or incident to which they relate, or soon afterwards, by individuals who have direct knowledge of the facts or by instruments routinely used within the normal course of business to conduct the transaction.

The **integrity** of a record refers to its being complete and unaltered. It is necessary that a record be protected against unauthorized alteration. Records management policies and procedures should specify what additions or annotations may be made to a record after it is created, under what circumstances additions or annotations may be authorized, and who is authorized to make them. Any authorized annotation; addition or deletion to a record should be explicitly indicated and traceable.

A **useable** record is one that can be located, retrieved, presented and interpreted. It should be capable of subsequent presentation as directly connected to the business activity or transaction that produced it. The contextual linkages of records should carry the information needed for an understanding of the transactions that created and used them. It should be possible to identify a record within the context of broader business activities and functions. The links between records that document a sequence of activities should be maintained. The records must be accessible for the duration of the retention period.

5.0 Agency Responsibilities

State agencies and local governments have responsibilities associated with the management of their records and information. These include the following:

- Develop and maintain a **Record Retention and Disposal Schedule**.
- Implement a retention and disposal policy.
- Select an appropriate record keeping system.
- Implement appropriate records management policies, procedures, and business practices.
- Develop a business analysis to determine whether microfilming will be a cost effective, efficient and durable method of managing records through the retention period of the record.
- Develop a quality assurance level of acceptance that confirms that the expectations of the agency are being met. Establishment of the acceptable levels of quality will in turn help to develop the quality control processes needed to achieve the desired results.

- Follow specific laws, rules and standards that govern records specific to the industry the records pertain to.

6.0 Micrographic Formats

As stated in section 2.0, this document focuses primarily on the production of roll microfilm. Formats other than roll microfilm may be used in place of the original record. These micrographic formats include Computer Output Microfilm (COM), microfilm jackets, aperture cards and step and repeat microfiche. Evaluation of these formats should be incorporated into the feasibility and needs assessment process.

7.0 Standard Operating Procedures

Standard operating procedures should be developed that define the basic processes involved in the production of microfilm.

A standard operating procedure is a document or a collection of documents that define the way certain functions or processes are routinely performed in the normal production environment. Types of functions or processes defined in the procedures may include, but may not be limited to:

- Equipment testing requirements and frequency
- Document preparation functions common to all record collections
- Index data and film backup
- Access and security
- Administration and maintenance
- Audit trails
- Disaster recovery
- Employee safety

8.0 Pre-production Sample for Quality

The standards require that a sample set of source digital images, or digital images equivalent in characteristics to the source documents, be assembled for the purposes of evaluating the microfilm results against defined quality criteria. Documents in the sample set should include examples of source documents whose quality is poor in addition to those relative to the majority of the documents. The results of the sample will dictate the necessary steps to be taken in the quality control process.

9.0 Quality Control

Quality control should be implemented for each application to be microfilmed. The standards require the quality control criteria be established based upon the results of the pre-production quality sample.

Quality control is defined as those steps incorporated into the production process that are designed specifically to reduce error. Quality criteria may include, but may not be limited to:

- Overall legibility

- Smallest detail legibility captured
- Completeness of detail
- Dimensional accuracy compared with the original
- Completeness of overall image area
- Density
- Image skew
- Image orientation
- Index data accuracy
- Image and index format compliance

Once the quality criteria for the various attributes are defined for the production process, procedures should be established to ensure that these criteria are met.

10.0 Quality Assurance

State agencies or local governments should implement necessary quality assurance processes for each application to be microfilmed. The standards require written quality assurance procedures for inspection. Successful application of these processes will help ensure that the records remain usable throughout their legally mandated retention period.

Quality assurance is the process by which the total product is examined to ensure that the quality criteria initially established in the pre-production test are met. The purpose of this quality assurance process is to establish sampling plans and procedures to inspect the individual attributes of the created product. Attributes are those measurable details defined as being important, such as: density, resolution, image skew, index accuracy, image clarity, etc. Upon receipt of a microfilm product the state agency or local government should verify microfilmed documents match the expectations defined by the sample set. Verification is needed to ensure that the attributes that were agreed upon at the onset of the project were successfully delivered.

Keep in mind that there is a significant difference between those quality control steps provided during the capture process that are designed to detect and correct errors and quality assurance which is designed to verify the validity and accuracy of the overall delivered product. While the capture process should provide quality control prior to product delivery, the end user should also perform its own quality assurance in order to verify that the delivered work product is acceptable.

In order to establish a meaningful sampling process there are three categories of information that should be established prior to the initiation of the production process. These categories can be derived from the sample set. To have a successful process the end user must:

- Identify the specific attributes of the work product that are critical to them
- Establish the Acceptable Quality Level (AQL) expressed as a percentage
- Establish a batch size expressed as a number of the items that are contained within the batch

From this information an inspection model can be developed that will, within the limits of the acceptability level, assure the state agency or local government that the delivered work product meets the established standard. The specific attributes that need to be defined are those elements of the microfilm that are determined to be critical to the overall success of the conversion process.

In a production environment, it is not sufficient to simply say, "This is a good image." Objective criteria that define what a good image is must be established so that the production process can routinely and reliably produce the defined "good image." Attributes must be defined objectively. Subjective attributes cannot be measured reliably. Be careful to select attributes that are critical to the desired output.

The end user quality assurance process must be performed in a timely manner in order to conform within agreed upon acceptance terms. Quality assurance should be performed before the original documents are destroyed.

Additional information regarding establishing a statistical sampling model can be found in ANSI/AIIM TR34-1996 – Sampling Procedures for Inspection by Attributes of Images in Electronic Image Management (EIM) and Micrographics Systems (as amended or replaced).

11.0 Statement of Work

A statement of work (SOW) should be developed for each record collection or record type to be microfilmed.

The SOW defines the necessary tasks, film formats and product deliverables of a given job set. The SOW should include, but not be limited to:

- Definition of current environment
- Definition of the desired result
- Document preparation requirements and instructions
- Documented results of the quality control sample
- Index attributes
- Definition of the camera type
- Definition of the film type and dimensions
- Definition of the record sequence
- Quality control processes

12.0 Operational Practices

One of the significant benefits of the various microfilm formats is that their creation, use and management is supported by reasonable, practical and time tested processes and procedures that are designed to ensure that, when practiced, will result in reliable and dependable products. For purposes of defining the standards by which the microfilm should be created, the following items should be understood. By practicing these standards, the agency will ensure that the microfilmed version of the record is authentic, reliable, and usable and will maintain its integrity throughout the established retention period. There are several general practices that are critical. These are:

1. For records maintained on roll microfilm, only one record series should be permitted on each roll of film.
2. For permanent records, a security roll should be stored in an offsite area.
3. The security roll of film should not be used for any purpose other than to create a new duplicate.
4. The original documents may be destroyed only if all requirements for the creation of the original film have been met.

13.0 Reduction Ratio

Due to the variety of sizes and types of documents that can be microfilmed, it is not practical to specify which reduction ratio should be used. Any reduction ratio selected should result in producing the legibility and quality requirements identified in the sample test for quality. The standards require the characteristics of the record, the tasks the system is designed to perform, and the user requirements to be satisfied be taken into account when selecting a reduction ratio. If the reduction ratio is changed within a roll, the camera operator should indicate the change on a film target.

The reduction ratio is the relationship between the dimensions of an original and the dimensions of the corresponding microcopy. For example, reduction ratio is expressed as 24:1. The degree of reduction should be chosen after considering all of the system requirements. System requirements may include, but may not be limited to:

- Size, line width, quality, and contrast of the characters
- Size and shape of the original documents.
- Number of generations of film to be produced
- Resolution capabilities of the camera
- Size of film being used
- Magnification and image rotation capabilities of available viewing equipment
- Size and shape of screen on viewer
- Resolution and contrast characteristics of film being used for duplicates

A lower reduction ratio will typically provide higher image quality. Tradeoffs exist between image quality, storage density and film usage. If image quality alone is considered, larger images are usually better. A larger image is generally more tolerant of poor quality original documents and other microfilm variables such as density fluctuations, camera vibrations, and resolution loss.

14.0 Document Preparation

Preparation of the records prior to microfilming is critical to the success of the microfilm solution. Care should be taken in the preparation, content and arrangement of original records for microfilming to ensure that a true, accurate and complete reproduction is created. The functional steps in the preparation may include but may not be limited to:

1. Remove all staples, paper clips or other fastening devices
2. Repair all torn or damaged documents
3. Remove creases or folds for the pages so that no information is covered or lost
4. Identify any significant categories or subcategories of the collection prior to filming
5. Identify and locate missing or misfiled documents
6. Arrange the documents in the order in which they are to be microfilmed
7. Ensure that only pages of a single records series will be contained on any single roll of film.

15.0 Indexing

When filming original documents, all indexes, registers or other finding aids, if created, the standards require them to be microfilmed in the first frames of the first roll of a series, the last

frames of the last roll of a series or in the last frames of the last microfiche of a series. Indexing may also refer to the placement of flash cards or dividers that are microfilmed in order to facilitate rapidly locating specific information on a roll of film. Indexing may also take the form of a database or spreadsheet that helps identify the specific location of an image, or series of images, on a roll.

16.0 Blip

When using 16 mm roll film, a minimum single level blip mark should be used, even if there is no intention of utilizing them. This may aid the state agency or local government in the future migration of the microfilm images should it become necessary.

Image marks or blips are used to identify the frame number of each frame on a roll of film. They are created by the camera at the time of image capture, and are used to facilitate rapid retrieval of items from a roll. Each frame number is uniquely identified by a sequential number on each roll. Computer Assisted Retrieval (CAR) systems may have a unique blip configuration that should be identified in the needs analysis. For additional information, refer to ANSI/AIIM MS8-1988 (R1998) – Image Mark (Blip) Used in Image Mark Retrieval Systems (as amended or replaced).

17.0 Targets

The following film targets are required by the standards to certify the authenticity of the records being filmed:

Beginning of Roll

- Density/Resolution Target
- Start Target/Certification of Authenticity - Identifies the government unit, record title, date of filming, reduction ratio, operator's name and roll number.

Throughout Roll

- Flash targets – if necessary, identifies file breaks for localized searching.
- Miscellaneous targets as necessary to identify corrections, omissions, retakes, or additions.

End of Roll

- End Target/Certification of Authenticity
- Density/Resolution Target

Targets at the beginning and end of a roll of microfilm are a part of the bibliographic and technical control. Targets describe the owner of the record, the type of the record, when the microfilm was made, certifies the authenticity of the record, and provide the technical targets used to objectively evaluate the density, resolution and reduction ratio of the film.

18.0 Film Leader/Trailer

The standards require no less than a 3-foot leader of film before the first target of the roll and no less than a 3-foot trailer after the last target of the roll of film.

19.0 Media

19.1 Original (master) Film

The standards require that only polyester based silver gelatin film LE-500 be used.

Selecting the correct microfilm stock is particularly important when the record has long-term retention attributes. Other (older) film stocks may be made of materials that have known deficiencies in their chemical composition that may cause serious problems with respect to meeting long-term retention requirements. A master negative on any other type of film will not be considered to have Life Expectancies (LE) of 500 years.

19.2 Duplicate Film

The standards require duplicate copies for daily use be made if the film is expected to be handled more than 10 times during its lifetime.

One of the significant advantages of the various microforms is the relative ease and low cost of duplication. It is important to note that use of film on a routine daily basis should be performed from duplicate rolls created from the camera original. Evaluation of the need for duplicates should be incorporated into the feasibility and needs assessment process. Duplicate films may be silver-gelatin film, diazo film or vesicular film. Diazo film is the recommended and preferred type for usage film.

20.0 Density

The three critical density measurements that comprise a properly exposed and processed micrographic image are:

- **D-MAX:** The highest density achieved in an exposed and processed image. D-MAX range shall be from .80 to 1.20.
- **D-MIN:** The lowest density achieved in an exposed and processed image. D-MIN shall not be greater than .06.
- **Base-plus-fog:** The base-plus-fog density of a film that has been processed but not exposed. Base-plus-fog shall not exceed 0.06.

Density measurements must be made using a properly calibrated densitometer. For high volume production, the densitometer should be calibrated daily. A systematic process of monitoring and recording these densities should be performed in accordance with ANSI/AIIM MS23-1998 – Practice for Operational Procedures / Inspection and Quality Control of First-Generation Silver-Gelatin Microfilm of Documents (as amended or replaced).

By definition, density is the ability of a photographic object to transmit light. The higher the density, the darker the image (or area of an image) and the lower the density the lighter the image. This is true for all original silver microfilms, and may be true for some types of duplicate copy films. The concept of density is critical in the creation of microfilm because the images should not be excessively dark, nor excessively light. An objective reference by which density can be measured is needed to ensure that the microfilm images are legible.

21.0 Resolution

Generally, for common type fonts of 8 point or greater, the acceptable level of resolution for a rotary camera is a minimum of 90 line pairs per millimeter. Acceptable level of resolution for a planetary camera is a minimum of 120 line pairs per millimeter.

For smaller type fonts, embellished type fonts, and hand written documents, acceptability levels are directly related to the document collection, and therefore the quality index (QI) method for determining resolution should be employed. For additional information, refer to ANSI/AIIM MS23-1998 – Practice for Operational Procedures / Inspection and Quality Control of First-Generation Silver-Gelatin Microfilm of Documents (as amended or replaced).

Resolution is the ability of a photographic system (film, lens and processing) to record fine detail. This concept is critical in order to ensure that the microfilm images are sharp and clear enough to be considered reliable and usable. Poor resolution yields images that appear as fuzzy or unclear. Resolution is determined by reading the line count and direction method using the ISO test chart No.2 (or similar) for planetary cameras and ANSI/AIIM MS17-1992 test chart (or similar) for rotary cameras. Using a microscope with a 100 X lens the inspection of microfilm produced from documents with common font types must yield a minimum resolution of 90 line pairs for rotary cameras and a minimum of 120 line pairs for planetary cameras. Resolution is determined by sighting the line pair pattern where all five lines and spaces in both the horizontal and vertical direction can be discerned. Multiply the numbered pattern that can be viewed as described by the known reduction ratio of the image. The numeric result is the effective resolution. The standards require resolution meet the minimum line pairs in all four corners, as well as the center of the each resolution chart contained on the roll of film.

22.0 Silver Film Processing

The standards require exposed microfilm to be processed within two weeks of the completion of the image capture.

Processing must be carefully controlled in order to ensure consistent results. Film produced for purposes of managing public records must be processed in accordance with ISO 18901:2002 – Imaging materials – Processed silver-geatin type black-and-white films – Specifications for stability and ANSI/AIIM MS23-1998 – Practice for Operational Procedures / Inspection and Quality Control of First-Generation Silver-Gelatin Microfilm of Documents (as amended or replaced).

23.0 Residual Thiosulfate

The standards require testing for residual thiosulfates (commonly known as methylene-blue testing) be performed not less than once per week. LE-500 films should contain no more than 0.014 g of thiosulfate ion per m^2.

In normal silver film processing, fixer or “hypo” is used to remove unused silver particles from the emulsion of the film. If left in the emulsion, these silver particles will continue to react and over time begin to alter the appearance of the film. Fixer is a fairly strong basic compound. If left on the film this basic (salty) compound will damage the film image. The fixer must be sufficiently washed from the film in order to reduce the possibility of damage to the film in the future. Residual thiosulfate should be measured using ANSI/NAPM IT9.17-1993 – Photography-Determination of

Residual Thiosulfate and Other Related Chemicals in Processing Photographic Materials-Methods Using Iodine-Amylose, Methylene Blue and Silver Sulfide (as amended or replaced). In cases where a third party is processing the film, tests should be performed weekly. In the event of a failure, all film processed after the last successful test should be recalled, rewashed and retested in order to ensure that sufficiently low levels of residual thiosulfates reside on the film. This re-washing process must be performed within two weeks of the original film processing.

24.0 Inspection of Newly Processed Film

Newly processed film should be inspected for both major and minor defects. Identification of these defects may lead to the creation of retakes for a given roll or if the defects are indeed major, the entire roll may be rejected. Examples of minor defects would be skewed images, images in a wrong orientation, images that have a folded edge or corner or overlapped images. Minor defects can be categorized as those that can be repaired by recreating and replacing the defected image. Major defects may include a failure to meet minimum resolution requirements, failure to meet minimum density requirements or incorrect start or end of roll targets. Major errors cannot be repaired. Failure to meet minimum requirements is cause to re-film the contents of the roll. All potential defects should be addressed in the quality assurance process to insure that the quality criteria initially established in the pre-production test have been met. For more information regarding inspection of original microfilm see ANSI/AIIM MS23-1998 – Practice for Operational Procedures / Inspection and Quality Control of First-Generation Silver-Gelatin Microfilm of Documents (as amended or replaced)**.**

25.0 Splicing and Retakes

The standards require a single roll of film to contain no more that one splice and no more that three retakes. Splices can be made using heat, ultrasonic or splice tape manufactured specifically for that purpose. Splices are to be butt splices not overlap splices. If tape splices are used, no rubber-based adhesives shall be contained in the tape material.

If during the normal inspection process, it is determined that errors in the filming process have taken place, it is permissible to corrected images on a separate roll of film and then add the corrections to the end of the original roll. Any such corrections must be clearly identified both on the roll itself and on the label of the roll. The corrective film should contain a list of the retaken images in front of the images being added. The splice should be made no less than 6 inches from the End of Roll Target. A single re-take may contain a single image or multiple consecutive images (as displayed on the original film), however, the splice should not contain more that 2 feet of images in total. A splice in the film should not be made at any point between the start target and the end target. Splicing should be used only for corrective action and not be part of the normal operation of creating a roll of microfilm.

During the filming process it is possible for the operator to detect an error immediately at the time of filming. In that event the operator may correct the error by filming a START RETAKE target followed immediately by the corrected images followed by an END RETAKE target. This type of correction requires no splicing.

26.0 Film Storage

Under ideal circumstances, properly manufactured, processed and stored polyester based silver gelatin microfilm (LE-500) can be expected to last for as much as 500 years. The conditions required to meet this life expectancy are: (1) the residual thiosulfate levels are sufficiently low, and (2) the film is stored in an environmentally controlled storage facility. An environmentally controlled facility should meet the following minimum requirements:

- The original (or security film) should be stored in a separate building from the duplicate or working copy.
- The storage room must be separate from other types of storage, offices or work areas.
- The storage room must be equipped with a fire alarm system.
- Stored in a constant cool environment with temperatures not exceeding 70 degrees.
- The humidity of the storage facility must be maintained at 35% +/- 5%.
- Dissimilar films (silver, diazo, vesicular) should not be stored in the same storage container or cabinet.
- Contained in acid free cardboard boxes or inert plastic containers.

For more information regarding storage environment see ISO 18911:2000 – Photography -- Processed safety photographic films -- Storage practices (formerly ANSI/NAPM IT9.11-1993) (as amended or replaced).

27.0 Inspection of Stored Film

As stated in section 19 properly manufactured, processed and stored polyester based silver gelatin microfilm (LE-500) can be expected to last for as much as 500 years. However, since stored films may have the possibility of interacting with other films that are of a different generic type (for example, diazo and silver-gelatin), routine inspection is recommended.

Inspections of the microfilm stored in the facility should be routinely performed to determine to what extent reactions that may be harmful to the film are occurring. State agencies or local governments should develop a microfilm inspection program in order to monitor the condition of the stored film. At minimum, each year a random sample of not less than 2% of the total number of rolls stored in the facility should be examined to determine if deterioration is taking place. Each successive year the sampling population should include new rolls stored in the facility and the balance of the rolls not examined in the previous year. Film collections containing older films should be inspected in greater numbers. Guidelines for inspection are available in ANSI/AIIM MS45-1990 – Recommended Practice for Inspection of Stored Silver Gelatin Microforms for Evidence of Deterioration (as amended or replaced).

28.0 Expungement

The standards require images to be expunged by using the abrasion method and only in accordance with an approve retention schedule or court order. Punching a hole in the image, blotting out the image with any type of ink or marker or by chemically removing the image should not be conducted because it may damage surrounding images. Any duplicates in existence should be recalled, destroyed, re-duplicated from the corrected original and re-issued. It is required that an expungement certificate be maintained that details the reason for the expungement, the authority to expunge, the date of the original filming and the date of the expungement. The expungement certification should also indicate that the original and all copies have been expunged.

Expungement is the removal or destruction of an image from a microfilm recording. This procedure requires that no record or identification of the documentation ordered expunged remain on the film.

29.0 References

The following standards and recommended practices issued by the American National Standards Institute (ANSI), the Association for Information and Image Management (AIIM), the National Association of Photographic Manufacturers (NAPM) and the International Association for Standards (ISO) may contain additional information that will assist state agencies and local government with compliance with Michigan law. These publications are available from the Association for Information and Image Management, 1100 Wayne Ave., Suite 1100, Silver Spring, MD 20910-5699, http://www.ansi.org/.

ANSI/AIIM MS1-1996 – Recommended Practice for Alphanumeric Computer-Output Microform – Operational Practices for Inspection and Quality Control

ANSI/AIIM MS4-1987 – Flowchart Symbols and Their Use in Micrographics

ANSI/AIIM MS5-1992 (R1998) – Microfiche

ANSI/AIIM MS6-1981 (R1993) (R1999) – Microfilm Packaging Labeling

ANSI/AIIM MS8-1988 (R1998) – Image Mark (Blip) Used in Image Mark Retrieval Systems

ANSI/AIIM MS9-1987 (A1996) – Method of Measuring Thickness of Buildup Area on Unitized Microfilm Carriers (Aperture, Camera, Copy and Image Cards)

ANSI/AIIM MS10-1987 (R1993) – Method for Determining Adhesion of Protection Sheet to Aperture Adhesive of Unitized Microfilm Carrier (Aperture Card)

ANSI/AIIM MS11-1987 (R1993) (R1999)– Microfilm Jackets

ANSI/AIIM MS12-1990 – Readers for Transparent Microforms – Methods for Measuring Performance Characteristics

ANSI/AIIM MS14-1988 (R1996) – Specifications for 16 and 35 mm Roll Microfilm

ANSI/AIIM MS15-1990 – Dimensions and Operational Constraints for Single Core Cartridge for 16 mm Processed Microfilm

ANSI/AIIM MS17-1992 – Rotary (Flow) Microfilm Camera Test Chart and Test Target – Descriptions and Use

ANSI/AIIM MS18-1992 (R1998) – Splices for Imaged Film – Dimensions and Operational Constraints

ANSI/AIIM MS19-1993 – Recommended Practice for Identification of Microforms

ANSI/AIIM MS20-1990 – Readers for Transparent Microforms – Performance Characteristics

ANSI/AIIM MS23-1998 – Practice for Operational Procedures / Inspection and Quality Control of First-Generation Silver-Gelatin Microfilm of Documents

ANSI/AIIM MS24-1996 – Test Target for Use in Microrecording Engineering Graphics on 35 mm Microfilm

ANSI/AIIM MS26-1990 – 35 mm Planetary Cameras (top light) – Procedures for Determining Illumination Uniformity of Microfilming Engineering Drawings

ANSI/AIIM MS26A-1999 – Amendment - 35 mm Planetary Cameras (top light) – Procedures for Determining Illumination Uniformity of Microfilming Engineering Drawings

ANSI/AIIM MS28-1996 – Alphanumeric COM Quality Test Slide

ANSI/AIIM MS29-1992 – Cores and Spools for Recording Equipment – Dimensions

ANSI/AIIM MS32-1996 – Microrecording of Engineering Source Documents on 35 mm Microfilm

ANSI/AIIM MS34-1990 – Dimension for Reels Used with Processed 16mm and 35 mm Microfilm Not for Use in Automatic Threading Equipment

ANSI/AIIM MS35-1990 – Recommended Practice for the Requirements and Characteristics of Original Documents that may be Microfilmed

ANSI/AIIM MS36-1990 – Reader-Printers

ANSI/AIIM MS37-1988 (A1996) – Recommended Practice for Microphotography of Cartographic Materials

ANSI/AIIM MS38-1995 – Microrecording of Engineering Graphics – Computer-Output Microfilm

ANSI/AIIM MS39-19987 – Recommended Practice for Operational Procedures, Quality Control & Inspection of Graphic Computer-Output Microforms

ANSI/AIIM MS40-1987 (R1992) (1999) – Microfilm Computer Assisted Retrieval (CAR) Interface Commands

ANSI/AIIM MS41-1996 – Dimensions of Unitized Microfilm Carriers and Apertures (Aperture, Camera, Copy and Image Cards)

ANSI/AIIM MS42-1989 – Recommended Practice for the Expungement, Deletion, Correction or Amendment of Record on Microforms

ANSI/AIIM MS43-1998 – Operational Procedures/Inspection and Quality Control of Duplicate Microforms of Documents and from COM

ANSI/AIIM MS45-1990 – Recommended Practice for Inspection of Stored Silver Gelatin Microforms for Evidence of Deterioration

ANSI/AIIM MS46-1990 (A1996) – Test Target and Test Method for Determining Output of 35 mm Microfilm Duplicators

ANSI/AIIM MS47-1990 – Rotary Cameras for 16 mm Microfilm – Mechanical and Optical Characteristics

ANSI/AIIM MS48-1990 – Recommended Practice for Microfilming Public Records on Silver Halide Film

ANSI/AIIM MS51-1991, ANSI/ISO 3334-1989 ISO Chart No.2 – Description and Use in Photographic Reproduction

ANSI/AIIM MS111-1994 – Recommended Practice for Microfilming Printed Newspapers on 35 mm Microfilm

ANSI/AIIM TR1-1988 (A1992) – Guidelines for Metrics

ANSI/AIIM TR2-1998 – Glossary of Document Technologies

ANSI/AIIM TR4-1989 (A1993) – Silver Recovery Techniques

ANSI/AIIM TR9-1989 (R1992) – Color Microforms

ANSI/AIIM TR11-1987 (A1993) – Microfilm Jacket Formatting and Loading Techniques

ANSI/AIIM TR12-1988 (R1997) – Bar Coding on Microfiche for Production and Dynamic Distribution Control

ANSI/AIIM TR13-1998 – Preservation of Microforms in an Active Environment – Guideline

ANSI/AIIM TR16-1988 – Content of Production Specification Sheets for Microform Readers and Reader-Printers

ANSI/AIIM TR20-1994 – Environmental and Right-to-Know Regulations Affecting Microfilm Processors

ANSI/AIIM TR26-1993 – Resolution as it Relates to Photographic and Electronic Imaging

ANSI/AIIM TR34-1996 – Sampling Procedures for Inspection by Attributes of Images in Electronic Image Management (EIM) and Micrographics Systems

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