STANDARDS FOR MICROFILMING MUNICIPAL RECORDS

1. Authority

The standards were adopted by the Local Government Records Committee in accordance with the Municipal Records Act.

2. Purpose

The standards are designed to help ensure the accuracy, usability, longevity and legal acceptance of microforms generated by municipal offices.

3. Scope

The standards relate to the filming, processing, inspection, handling and storage of microform copies, of records created by municipal offices covered by the Municipal Records Act. They must be included as part of the requirements in all microfilm service contracts. With minor exceptions, these standards are in strict conformance with American National Standards Institute (ANSI) and Association for Information and Image Management (AIIM) standards and practices. Raster Output Microforms are covered by the standards. Color films are not covered by the standards.

4. Definitions

AIIM. Acronym for Association for Information and Image Management. AIIM was founded in 1943 as the National Microfilm Association and later became the Association for Information and Image Management. AIIM is an ANSI (American National Standards Institute) accredited standards development organization. AIIM also holds the Secretariat for the ISO (International Organization for Standardization) committee focused on information management compliance issues.

ANSI. Acronym for the American National Standards Institute. ANSI is comprised of government agencies, organizations, companies, academic and international bodies, and individuals.

Aperture card: (1) A card with a rectangular opening(s) specifically prepared for the mounting or insertion of microfilm. (2) A processable card of standard dimensions into which microfilm frames can be inserted.

Archival quality: The ability of a processed print or film to permanently retain its original characteristics. The ability to resist deterioration.

Base: Transparent plastic material, usually of cellulose triacetate or polyester, upon which a photographic emulsion or other material may be coated.

Camera microfilm: First generation microfilm; also called the master film.

Computer-Output Microfilm (COM): Microforms containing data produced by a recorder from computer-generated electrical signals.

Dense (Density): (1) The light-absorbing or light-reflecting characteristics of a photographic image. (2) The relation of amount of text to non-text areas on a document.

Dots per inch (dpi): Measure of output device resolution and quality, e.g., number of pixels per inch on display device. Measures the number of dots horizontally and vertically.

Duplicate: (1) A copy of a microform made by contact printing or by optical means. (2) To make multiple copies of a document or
microfilm, usually with the aid of the master film or intermediate copies.

**Emulsion:** A single- or multi-layered coating consisting of light-sensitive materials in a medium carried as a thin layer on a film base.

**Exposure:** (1) The act of exposing a sensitive material to light/radiant energy. (2) The time during which a sensitized material is subjected to the action of radiation. (3) The product of radiation intensity and the time during which it acts on the photosensitive material.

**Generation:** One of the successive stages of photographic reproduction. The first generation is the camera film. Copies made from this first generation are second generation, etc.

**Image:** (1) A representation of information produced by light/radiant energy. (2) In electronic imaging, digital representation of a document.

**ISO.** Acronym for the International Organization for Standardization. ISO is the world's largest developer and publisher of International Standards. ISO is a network of the national standards institutes of 157 countries. ISO is a non-governmental organization that forms a bridge between the public and private sectors.

**Jacket:** A flat, transparent, plastic carrier with single or multiple film channels made to hold single or multiple microfilm images.

**Master film:** Any film, but generally the camera microfilm, used to produce further reproductions, such as intermediates or distribution copies.

**Methylene blue:** A chemical dye formed during the testing of archival permanence of processed microimages using the methylene-blue method.

**Microfiche:** A transparent sheet of film with microimages arranged in a grid pattern.

**Microfilm:** (1) A fine-grain, high-resolution film used to record images reduced in size from the original. (2) A microform consisting of strips of film on rolls that contain multiple microimages. (3) To record microphotographs on film.

**Microform:** A form, usually film, which contains microimages.

**NAPM:** Acronym for National Association of Photographic Manufacturers, Inc. Trade and technical information organization of photographic products manufacturers and suppliers. Also a standards developer for the fields of photography and optics both domestically and internationally. Standards secretariat and developer for ANSI/NAPM IT (Imaging Technologies) committees, ISO TC42-Photography and ISO TC172-Optics and optical instruments.

**Negative-appearing image:** An image in which the lines and characters appear light against a dark background.

**NIST:** Acronym for National Institute for Standards and Technology. Formerly known as the National Bureau of Standards (NBS), founded in 1901, NIST is a non-regulatory federal agency within the U.S. Department of Commerce.

**Planetary camera:** A type of microfilm camera in which the document being photographed and the film remain in a stationary position during the exposure. The document is on a plane surface at the time of filming. Also known as a flatbed camera.

**Polyester:** A transparent plastic made from polyesters and used as a film base because of its dimensional stability, strength, resistance to tearing and relative nonflammability.
**Positive-appearing image:** An image in which the lines and characters appear dark against a light background.

**Processing:** A series of steps involved in the treatment of exposed photographic material to make the latent image visible and ultimately usable, e.g., development, fixing, washing, drying.

**Raster:** Description of a rectangular or square array formed by a number of horizontal scan lines comprising a number of picture elements. The number of scan lines establishes the vertical dimension of the array and the number of picture elements forms vertical rows which establish the horizontal dimension of the array.

**Raster COM (R-COM):** Device that produces microforms from any computer-managed pixel image storage device.

**Records, Permanent:** Records which have been scheduled for permanent retention by the Local Government Records Committee or by applicable statute or regulation.

**Records, Vital:** Records, regardless of archival value, which are essential to functions of government during and after an emergency. Also, those records essential to the protection of the rights and interests of that organization and of the individuals for whose rights and interests it has responsibility.

**Reduction ratio:** The relationship (ratio) between the dimensions of the original or master and the corresponding dimensions of the microimage; e.g., reduction ratio is expressed as 1:24.

**Residual thiosulfate ion:** Ammonium or sodium thiosulfate (hypo) remaining in film or paper after washing. Synonymous with residual hypo.

**Resolution:** The ability of a photographic system to record fine detail.

**Roll microfilm:** Microfilm that is or can be put on a reel, spool or core.

**Rotary camera:** A type of microfilm camera that photographs documents while they are being moved by some form of transport mechanism. The document transport mechanism is connected to a film-transport mechanism, and the film also moves during exposure so there is no difference in the rate of relative movement between the film and the image of the document.

**Safety film:** A comparatively nonflammable film support (base) that meets ANSI requirements for safety film.

**Silver film:** A photographic film containing photosensitive silver compounds suspended in a suitable material. When developed, the image consists of metallic silver.

**Silver halide:** A compound of silver and one of the following elements known as halogens: chlorine, bromine, iodine, and fluorine.

**Splice:** A joint made by cementing, taping or welding (heat splice) two pieces of film or paper together so they will function as a single piece when passing through a camera, processing machine, viewer or other apparatus.

**Target:** (1) Any document or chart containing identification information, coding or test charts. (2) An aid to technical or bibliographic control that is photographed on the film preceding or following the document.

5. **General Provisions**

When a microform copy is to serve as or in place of the original record or is to serve as a security copy of the original record, the following general standards shall apply:
5.1 Microimages, including the generation intended for use by office staff or the general public, shall contain all of the recorded information shown on the originals and shall be able to serve the purpose for which the original records were created or maintained. Microimages shall be free of obstructions, shadows or glare which impair the legibility of a document.

5.2 Microimages of the records shall be arranged, identified and indexed so that any individual document or component of the records can be located with reasonable ease.

6. Creation of Archival Security Microfilm Copies of Permanent Records

6.1 All municipal records custodians engaged in, or contracting for, the microfilming of permanent records shall provide for the creation of an archival security microfilm copy of such records.

6.2 Permanent records are those records which have been scheduled for permanent retention either in the original or microfilm copy by the Local Government Records Committee or by applicable statute and regulation.

6.3 An archival security microfilm copy is a copy which is created, used, inspected and stored in conformance with standards for archival security microfilm.

6.4 The original camera film (Master Negative) of records scheduled for permanent retention shall never be used for reference purposes and should normally be designated as the archival security microfilm copy. Silver-gelatin duplicate negatives or silver-gelatin duplicate positives that meet appropriate standards may serve as the security copy if necessary. If the original camera film is to be jacketed or cut for aperture cards, an uncut duplicate roll of silver halide film that meets the appropriate standards for security film shall be made and designated as the official security copy. Records custodians employing systems that do not produce an original silver-gelatin microfilm which meets permanency standards shall make a silver-gelatin duplicate negative or silver-gelatin duplicate positive which does meet these standards.

7. Film Stock, Processing and Quality Standards for Archival Security Microfilm Copies of Permanent Records


7.2 Density: Background densities of negative-appearing archival security microfilm copies shall, where possible, be between .9 and 1.2. In certain instances, some poor-contrast documents may require lower densities in order to make the entire image legible and reproducible as mentioned in ANSI/AIIM MS23-2004, Standard Recommended Practice- Production, Inspection, and Quality Assurance of First-Generation, Silver Microforms of Documents. Densities of raster COM microforms should be adequate and uniform; all information must be reproduced accurately and completely so that its use will not be impaired. Raster COM microforms must meet all appropriate density standards. Background density on positive appearing negative camera film shall not exceed 0.35. The density of silver duplicate positives designated as the security copy shall be between 0.04 and 0.20 where possible. Background density of Computer Output Silver Gelatin (1N) Microfilm (full reversal processing) shall, where possible, be between 1.5-1.8 (1.8 preferred).

7.3 Base-plus-Fog Density: The base-plus-fog density of unexposed, processed, clear-based film shall not exceed 0.10. When a
tinted-base film is used, the density will increase by 0.10 or 0.20 which must be added to the 0.10 value. The use of tinted, high fog base films is not recommended.

7.4 **Resolution:** A minimum resolution of 90 lines per millimeter shall be obtained regardless of reduction ratio used or the type of camera used, and the 4.0 pattern shall be resolved. In cases where raster COM microforms are reproduced, measurement of resolution and quality of raster COM film is determined in dots per inch. Raster COM microforms must meet all appropriate resolution standards. A paper print made from the third generation microfilm copy should be able to serve the same purpose for which the original records were created.

7.5 **Residual Thiosulfate:** Residual Thiosulfate ion concentration must be greater than zero but shall not exceed 0.014 grams per square meter in a clear area in accordance with NAPM IT9.1-1996.

8. **Identification, Technical, and Declaratory Targets for Roll Microfilm**

8.1 All roll microfilm shall include targets which adequately identify the records and targets needed to check for compliance with resolution requirements. A blank, white sheet of paper shall be photographed at the beginning of each roll to test the uniformity of the illumination and the cleanliness of the camera's optical system. Resolution test targets shall be filmed near the beginning and end of each roll. Targets used shall be AIIM X303 or an equivalent for planetary cameras; or AIIM X113 or the equivalent for rotary cameras. Do not use photostatic or electrostatic copies of resolution charts. Identification targets shall state the name of the municipality and office; name and title of the records custodian responsible for the records at the time of filming; reduction ratio; and record series title, dates, and such volumes or serial numbers needed to clearly identify the records. Each roll shall end with a declaration by the camera operator. The declaration shall include the operator's signature, date the declaration was filmed, and restatement of records filmed. **Retakes and retake targets should normally be spliced onto the beginning of the roll in which the errors occurred, preceding the start target. The use of intelligent/blip encoded microfilm may necessitate the use of different retake procedures.**

8.2 **Filming sequence should be:**

1) Blank white sheet of paper
2) Start target
3) Roll number target
4) Resolution test target
5) Reduction ratio target
6) Agency and record series identification target(s)
7) If applicable, "continued from preceding roll" target--instances where volume is filmed on more than one roll
8) The text
9) If end of book, film "end of volume" target-if not end of volume, but end of roll coming, film "continued on next roll" target
10) If end of roll, film the declaration by the camera operator, the resolution target, and the "end of roll" target
11) Raster COM microforms should also contain a target stating the name of the conversion vendor; and a target indicating the dots inch (dpi) at which the conversion was done, in addition to proper identification targets (no resolution or scanner target should be overlaid on the microform)

9. **Splices**

Splicing of archival security microfilm rolls should be avoided, but if splicing is necessary, care should be taken to keep the number of splices to a maximum four per roll. Ultrasonic
splicing meets standards for polyester base film.

10. Quality Control Practices and Procedures

10.1 Procedures to be followed in establishing and operating a microfilm program should conform to appropriate recommendations contained in ANSI/AIIM MS23-2004, Standard Recommended Practice- Production, Inspection, and Quality Assurance of First-Generation, Silver Microforms of Documents. Each camera negative shall be checked for proper identification targets, density, resolution and visual defects.

10.2 The ability of archival security microfilm copies of permanent records to serve as a substitute for the original records shall be adequately confirmed and documented. Quality control logs for such film shall be maintained to document adherence to standards. At a minimum, such logs should verify the following:

10.2.1 The images are legible and can serve the purposes for which the original records were created or maintained.

10.2.2 Roll film contains all required identification, technical and declaratory targets.

10.2.3 Density readings were taken on a blank white sheet of paper at the beginning of the roll, and, at a minimum, on the background of document images at the beginning, middle, and end of each roll.

10.2.4 A Base-plus-Fog Density Reading (Dmin) for each roll.

10.2.5 The number of the pattern resolved from a reading of the resolution test chart and the reduction ratio on each roll.

10.2.6 Methylene Blue tests are being done on a regular basis. Testing should be done by an outside laboratory at a minimum on a monthly basis. Appropriate sample strips must be inspected within fourteen days after processing. Certificates from the laboratory, documenting that the microfilm passed the methylene blue test, should be maintained along with the logs. The certificates should include the name of the agency whose film was processed, processing date, date of methylene blue test, test results, processor used and the signature of the person who did the test.

11. Formats and Headings for Unitized Microfilm Systems (aperture cards, microfiche and jacketed film)

Unitized microfilm systems records should be designed and administered so that the resulting microfilm file is an accurate representation of the original records. Any indexes, registers, or other finding aids should be microfilmed and located in a readily identifiable place within the collection of microfilmed records. Formats for microfiche should conform to ANSI/AIIM MS5-1992. The data on heading or title areas on all microforms should be legible without magnification. The data should conform to ANSI/AIIM MS19-1993.

12. Computer Output Silver Gelatin (1N) Microfilm Procedures

COM programs should conform to standards set down in ANSI/AIIM MS1-1996. Density of Computer-Output Microfilm should be between 1.5 and 1.8 (Full Reversal).


13.1 Maximum temperature should not exceed 21 degrees Celsius (69.8 degrees Fahrenheit) with a variation of no more than three degrees Celsius (five degrees Fahrenheit) within a 24-hour period. Relative humidity should be kept within 20 percent to 30 percent. Cycling of relative humidity should be no greater than plus or minus five percent over a 24-hour period.

13.2 Air-conditioning with filtration system shall be utilized to remove gaseous impurities.

13.3 Facility shall provide protection from fire, theft and natural disaster.

13.4 The security microfilm copy shall be maintained in a separate building from the user copy.

13.5 Film shall be stored in closed containers made of an inert material such as plastic, acid-free paper, or nonferrous metals. Cores or reels shall be noncorroding such as plastic compounds or nonferrous metals. Rubber bands shall not be used to fasten film onto reels or cores.

13.6 Security copy shall not be stored with non-silver film.

13.7 As appropriate, a sampling of randomly selected microforms shall be inspected in conformance with ANSI/AIIM MS45. For each inspection period, a different lot shall be chosen allowing some overlap to note changes in previously inspected film.


14.1 The security microfilm copy of long-term records shall be created and stored in conformance with standards for archival security microfilm copies of permanent records. The following sections are applicable to long-term records: Sections 5, 6, 7, 8, 9, 10, 11, 12 and 13.

14.2 Long-term records are any records that need to be maintained for more than ten years either in the original or microfilm copy. Security microfilm copies of vital records should be stored where appropriate in conformance with standards for long-term and permanent records. All security microfilm copies of vital records, regardless of retention periods, should be stored in a separate building from the user copy.

15. Short-Term Records

15.1 Short-term records are defined as records that require retention for ten years or less as indicated in the Municipal Records Manual. Silver halide or other films are acceptable as the camera film. Film shall be processed in accordance with applicable ANSI/AIIM standards for their particular film types. The following sections are applicable to short-term records: Sections 5, 7.2, 7.3, 7.4, 8, and 10.1.

16. Reference Copies of Microforms

The standards relating to the film stock, processing, use and storage of archival security microfilm copies of permanent records do not apply to reference, user or additional duplicate copies. These copies may be on film types other than silver-halide, safety base film and should be processed in accordance with applicable ANSI/AIIM standards for their particular film types.

For additional information, contact:

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