



**SECRETARY
of STATE**

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Division of Archives & Records Management

**Washington State Standards
For the Production
And Use of**

MICROFILM

**Adopted by the State Archivist
In accordance with the provisions of
RCW 40.14**

Revised 2/2008

Authority: The standards published herein were adopted in 2008 by authority of Chapter 40.14, Revised Code of Washington, and are published by the Washington State Archivist to update and supersede the 1998 edition.

New sections: Standards have been added to address the conversion of digital files to microfilm. Varying resolution inspection methods have also been added to accommodate different document sources.

Note to public officials: These are minimum technical and procedural standards applying to the production, processing, inspection, storage, and handling of microfilm intended to serve as a copy of essential records secured against loss of the original or as a legal copy of public records required by law to be kept permanently. Specific authority to establish these standards is assigned to the State Archivist under RCW 40.14.020, section (8). ***It is strongly recommended that these standards be cited and incorporated into the language of contractual arrangements with vendors of microfilm services.***

Note to microfilm service providers: These standards set the minimum requirements for microfilming the permanent and essential public records of Washington State, and apply to all agencies and political sub-divisions of state government. In contracting to film essential and permanent public records, vendors should be prepared to guarantee in writing that the standard will be met. The technical standards described and cited herein apply to the production, processing, inspection, storage, and handling of microfilm intended to serve as a copy of essential records secured against loss of the original or a legal copy of public records required to be kept permanently. The State Archivist issues these standards by authority of Chapter 40.14.020, section (8), of the Revised Code of Washington.

Further information: For assistance or additional information regarding the use of this manual, contact the Washington State Archives at (360) 586-2487.

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Washington State Standards for the Production and Use of Microfilm

Adopted by the State Archivist in accord with the Provisions of Chapter 40.14 RCW.

In all microfilm applications intended to produce security or preservation microfilm copies of public records, the following minimum standards shall be adhered to in the selection, preparation, storage, and handling of film. Said standards must apply to "in-house" operations, as well as to all work committed to external service bureaus.¹

1 DEFINITIONS

- 1.1 **Public Records** - "The term 'public records' shall include any paper, correspondence, completed form, bound record book, photograph, film, sound recording, map drawing, machine-readable material, compact disc meeting current industry ISO specifications, or other document, regardless of physical form or characteristics, and including such copies thereof, that have been made by or received by any agency of the state of Washington in connection with the transaction of public business, and legislative records as described in RCW 40.14.100."²
- 1.2 **Essential Records** - Essential records, also referred to as vital records, are records essential to: 1) the resumption and/or continuation of operations; 2) the re-creation of the legal and financial status of the agency; or 3) the fulfillment of obligations to local, state, and federal governments and the public.³
- 1.3 **Permanent Records** - Permanent records are those records required by law or regulation to be retained indefinitely by the office or agency of origin.⁴ Records designated as permanent will be so identified in an approved records retention schedule.
- 1.4 **Archival Records** - Archival records are those records identified by the State Archivist, or his designees, as possessing sufficient historical value to be retained indefinitely. Records designated as archival must be approved as such by the State or Local Records Committee and will be so identified in an approved records retention schedule.

Note: Some records may meet all of the above definitions for essential, permanent, or archival records. For clarification contact the State Archives or one of its regional depositories.

¹ The standards and procedures set forth herein are based upon American National Standards Institute/Association for Information and Image Management MS48-1990 (*Recommended Practice for Microfilming Public Records on Silver-Halide Film*). Additional specific standards are cited when relevant.

² *Revised Code of Washington (RCW) 40.14.010*. ISO refers to the International Organization of Standardization.

³ On designating records as *essential*, see RCW 40.10.

⁴ The agency must retain the designated primary copy of the record.

- 1.5 **Direct Microfilming** - The process of microfilming using light reflected from the documents in order to expose film will herein be referred to as *Direct Microfilming*.
- 1.6 **Digital Microfilming** - *Digital Microfilming* refers to creating microfilm from digital images.
- 1.7 **Security Microfilm** - Security microfilm refers to microfilm that is produced with the explicit purpose of creating a secure, off-site backup to original public records officially identified as essential or permanent. The film is also produced with the specific intent of storing the original camera negative at the State Archives, apart from the original records or working copy microfilm.
- 1.8 **Preservation Microfilm** - Preservation microfilm will refer to film that is intended and suitable for use in the ongoing preservation of information contained in archival records, particularly where the original records are in a state of deterioration and are in danger of loss, or where it is desirable to easily disseminate copies.

Note: Both security and preservation microfilm must be manufactured, processed, and stored in accordance with national standards to achieve an LE-500 rating.⁵ The life expectancy of all microfilm is largely dependent upon:

1. Film Type
2. Photographic Processing
3. Storage Conditions and Handling

Thus, the life expectancy (LE) of microfilm depends upon film type, processing, storage conditions, and handling being in accord with the standards for such film hereinafter described.

2 MICROFILM QUALIFICATIONS

Microfilm may qualify as *security*, *preservation*, or *working copy*, depending on the retention value of the source documents to be filmed and/or the intended use of the resulting microfilm.

- 2.1 ***Security Microfilm or Preservation Microfilm*** is produced for those records that are officially designated as essential, permanent, or archival, according to the definitions outlined above.
- 2.2 ***Working Copy Microfilm***, also referred to as the reference, use or service copy, is microfilm designated for everyday use in an office or for other reference purposes. Working copy microfilm may be produced 1) as a copy of a security or preservation microfilm master or printing negative, or 2) as a first- or second-generation film where the filmed

⁵ The term LE (life expectancy), refers to the minimum number of years for which information may be retrieved without significant loss. In the case of LE-500, it is 500 years. See ANSI/NAPM IT9.1-1992 (*American National Standard for Imaging Media (Film)--Silver Gelatin Type--Specifications for Stability*) and ANSI/NAPM IT9.13-1992 (*American National Standard for Imaging Media--Photographic Films, Papers, and Plates--Glossary of Terms Pertaining to Stability*) for a more detailed explanation.

records are not of permanent value and are filmed for the purpose of active reference use for a period not to exceed six years.

Note: *If multiple working copies of security or preservation microfilm will be needed, it is recommended that the production of such microfilm conform to a three-generation system as noted in section 7.1 of ANSI/AIIM MS48-1990 (American National Standard for Information and Image Management--Recommended Practice for Microfilming Public Records on Silver-Halide Film).*

Such a system consists of an original camera negative, also called "master negative"; a second-generation copy of the camera negative, also called "duplicate negative," "printing master," or "printing negative," to be used for producing additional copies; and one or more third-generation working copies produced from the second-generation film.

3 FILM BASE AND EMULSION MATERIAL

3.1 Original Camera Film

Film base material for all microfilm records shall be durable and sufficient for the definition of that record as an original. All such film stock shall conform to the standard enunciated in ANSI/NAPM IT9.6-1991, ANSI/ISO 543-1995 (*American National Standard for Photography--Photographic Films--Specifications for Safety Film*).

All security or preservation microfilm must be produced on polyester-base film manufactured to achieve an LE-500 rating. Acetate-base films are not acceptable for security or preservation microfilm.⁶

Film emulsion material for security or preservation microfilm must be of the silver-halide type. Such film will comply with the minimum standards of quality as set forth in ANSI/NAPM IT9.1-1992 (*American National Standard for Imaging Media (Film)--Silver Gelatin Type--Specifications for Stability*).

Note: Agencies using microfilm systems that do not produce an original silver gelatin film that meets the standard for security microfilm must make a silver gelatin duplicate negative or positive that does meet the standard before depositing such film for security storage at the State Archives.

3.2 Working Copy Film

Working copies for reference or daily use may be of the silver halide, diazo, or vesicular composition, although diazo is preferred. An LE-500 rating is not required for duplication film, an LE-100 is

⁶ Polyester base is also referred to as "poly (ethylene terephthalate)." Acetate base is also referred to as "cellulose ester," and includes cellulose acetate, cellulose acetate propionate, and cellulose acetate butyrate. See ANSI/NAPM IT9.6-1991, ANSI/ISO 543-1990 for a further discussion of base types.

recommended. Polyester-base film is not required, but is nonetheless recommended for its superior durability.

3.3 Film Generations

1. First Generation - Camera Master Negative (silver halide)
2. Second Generation - Reproduction microfilm made from first-generation microfilm (silver halide, diazo, or vesicular)⁷
3. Third Generation - Reproduction microfilm made from second-generation microfilm (silver halide, diazo, or vesicular)
4. Fourth Generation - Reproduction microfilm made from third-generation microfilm (silver halide, diazo, or vesicular)

4 DOCUMENT PREPARATION

4.1 Preparation

Proper care shall be taken in the preparation, contents, and arrangement of original records for filming to see that a true, accurate, and complete reproduction is made.⁸

Remove all staples, paper clips, and attachments, etc., before document filming.

Mend tattered or torn documents prior to filming to eliminate camera malfunctions and filming errors, and to protect the original records against further damage.⁹

Eliminate creases or folds in the documents by pressing or flattening, either mechanically or manually, to prevent shadows, risk of damage to the document, or camera malfunction.

Pages of post-bound volumes may be removed for filming provided that they are replaced without damaging the book. Sewn volumes of historical value must be filmed in such a manner so as not to break or destroy the bindings.¹⁰

⁷ When using the three generation system as described in the note below section 2.2, the second generation, or printing master in this case, must be made of silver halide type film.

⁸ Restoration or repair of documents determined to be of historical value will be in accord with procedures established by the State Archives.

⁹ Do not use pressure sensitive adhesive tape. Please consult the State Archives.

¹⁰ Contact the State Archives if you have any questions or concerns about bound volumes.

4.2 Arrangement

Source documents shall be arranged and filmed in a manner consistent with their customary reference and use, or as specified by the agency of record.

5 MICROFILM AND CONTAINER IDENTIFICATION¹¹

5.1 Direct Film Roll Film Identification

Eye-readable targets must be filmed at the beginning and end of each roll of film as follows¹²:

- 5.1.1 “Beginning of Roll” and “End of Roll” Targets, before the first and after the last image on the roll.
- 5.1.2 Density Target, 3 sheets of 8 ½ X 11 white paper just after the “Beginning of Roll” target and just before the “End of Roll” target.
- 5.1.3 “Certificate of Authenticity”,¹³
- 5.1.4 “Information” or “Guide Sheet”, describing the records series or inclusive portions thereof found on the roll of film, the beginning and ending index numbers or letters, date filmed, the type of camera, the film and reduction ratio, Disposition Authority Number, the name of the camera operator, and if necessary, the name of the organization performing the work.
- 5.1.5 Resolution Test Chart (see section 6.2.1 of this guide).
- 5.1.6 Flash Targets, at appropriate places in the film, as required for reference point, i.e., for each file folder, each change of alphabetical category, etc., or as specified by contract.

Note: Correct targeting of microfilm is critical to quality control, and lack of proper targets may impact court admissibility.

¹¹ The following section applies to all microfilm, both original and duplicate copies.

¹² Refer to the Sample Targets at the end of this guide, or call the State Archives to obtain Targets.

¹³ The “Certificate of Authenticity” target is not required to meet the standards which are contained in this manual. The target (see Appendix 2 for an example) may be altered or omitted, depending upon the legal requirements as set forth by the office for which the records are being filmed.

5.2 Film Container Identification

Roll film containers should clearly identify:

1. The office of record
2. Records series
3. Inclusive file numbers or alphabetical range
4. Inclusive dates
5. Date filmed
6. Roll number
7. Disposition Authority Number (DAN)
8. Inspection results for density and resolution
9. The reduction used for filming the roll
10. Generation number
11. Reels containing varying reductions must also include the height of the representative lower case "e" as described in ANSI/AIIM MS-23.

6 PRODUCTION AND INSPECTION - QUALITY CONTROL STANDARDS¹⁴

6.1 Reduction Ratios¹⁵

- 6.1.1 Reduction ratios for simplex cine or comic mode will vary with the size of the documents and the size of the film. Legal- or letter-size documents on 16mm microfilm should be within the 20:1 to 32:1 reduction range, ideally 24:1. For 35mm microfilm the recommended reduction ratio range is 8:1 to 14:1, ideally 12:1.¹⁶
- 6.1.2 Unburst computer printouts may be filmed simplex cine at 32:1.
- 6.1.3 Reduction ratios for duplex modes should not exceed 32:1 when using 16mm film.
- 6.1.4 Reduction ratios employed in the filming of oversized documents, exclusive of engineering drawings, may be adjusted consistent with retrieval needs for either 16mm or 35mm film.
- 6.1.5 Engineering drawings will be filmed at 15:1, 16:1, 24:1, or 30:1 reductions, depending on drawing size. Filming with a 4- to 6-inch scale is recommended. This will enable reproduction

¹⁴ This section applies both to camera originals and to duplicate copies.

¹⁵ Documents filmed on 35mm film and then reduced to 16mm film, may or will have a reduction ratio greater than 32:1.

¹⁶ For security or preservation microfilm, 35MM microfilm is recommended, although not required.

from the original negative to full scale, although half-size is acceptable in most situations.

6.2 Resolution

- 6.2.1 Each roll of film will contain a photographic image of the standard resolution test card or chart. International Organization for Standardization (ISO) Test Chart No. 2 as specified by ANSI/AIIM MS51-1991 (*American National Standard for Microcopying--ISO Test Chart No. 2--Description and Use in Photographic Documentary Reproduction*), or National Bureau of Standards Form 1010A, or their equivalent for rotary cameras, must be filmed at the beginning and ending of each roll.

These chart images should be used to monitor resolution as filming progresses. The line patterns must be read in each corner and in the center of each chart (or on a diagonal for rotary cameras) and the lowest resolution reading must be posted to the film container and to the guide sheet or other laboratory record.

Substandard results must be reported immediately to the office of record or to the camera station. The cause of the substandard resolution must be identified and corrected prior to further production filming. All substandard film shall be corrected before shipping to the State Archives for storage.

- 6.2.2 For films with a consistent reduction throughout the reel, a minimum of 120 lines per millimeter shall be obtained regardless of the reduction ratio type of camera used.

Reels with varying reductions must attain a quality index of 5 or higher using the **Quality Index Method** of evaluating resolution as described in ANSI/AIIM MS23-1991 (*American National Standard for Information and Image Management - Practice for Operational Procedures/Inspection and Quality Control of First Generation Silver-Gelatin Microfilm of Documents*). **This does not refer to the number 5 line-pair reading on standard resolution charts.**

6.3 Density

- 6.3.1 All camera film must be optically inspected for density using a transmission type densitometer designed to measure diffuse density. Test results must be posted to the film carton and to the guide sheet or other laboratory record. The film production