

the target must also identify the person who authorized the microfilming. See ANSI/AIIM MS19-1993 for standards for identification targets.

(d) The following formats are mandatory standards for microforms:

(1) *Roll film.* (i) *Source documents.* The formats described in ANSI/AIIM MS14-1996 must be used for microfilming source documents on 16mm and 35mm roll film. A reduction ratio no greater than 1:24 is recommended for typewritten or correspondence types of documents. See ANSI/AIIM MS23-1998 for the appropriate reduction ratio and format for meeting the image quality requirements. When microfilming on 35mm film for aperture card applications, the format dimensions in ANSI/AIIM MS32-1996, Table 1 are mandatory, and the aperture card format "D Aperture" shown in ANSI/AIIM MS41-1996, Figure 1, must be used. The components of the aperture card, including the paper and adhesive, must conform to the requirements of ANSI/PIMA IT9.2-1998. The 35mm film used in the aperture card application must conform to film designated as LE 500 in ANSI/NAPM IT9.1-1996.

(ii) *COM.* Computer output microfilm (COM) generated images must be the simplex mode described in ANSI/AIIM MS14-1996 at an effective ratio of 1:24 or 1:48 depending upon the application.

(2) *Microfiche.* For microfilming source documents or computer generated information (COM) on microfiche, the formats and reduction ratios prescribed in ANSI/AIIM MS5-1992 (R1998) must be used as specified for the size and quality of the documents being filmed. See ANSI/AIIM MS23-1998 for determining the appropriate reduction ratio and format for meeting the image quality requirements.

(e) *Index placement*—(1) *Source documents.* When filming original (source) documents, place indexes, registers, or other finding aids, if microfilmed, either in the first frames of the first roll of film or in the last frames of the last roll of film of a series. For microfiche, place them in the last frames of the last microfiche or microfilm jacket of a series.

(2) *COM.* Place indexes on computer-generated microforms following the data on a roll of film or in the last

frames of a single microfiche, or the last frames of the last fiche in a series. Other index locations may be used only if dictated by special system constraints.

#### § 1230.14 What are the filming requirements for permanent and unscheduled records?

(a) *General requirements.* (1) Apply the standards in this section for microfilming of:

(i) Permanent paper records where the original paper record will be destroyed or otherwise disposed of;

(ii) Unscheduled paper records where the original paper record will be destroyed or otherwise disposed of; and

(iii) Permanent and unscheduled original microform records (no paper originals) produced by automation, such as computer output microfilm (COM).

(2) Do not destroy permanent or unscheduled paper records after microfilming without authorization from NARA on a SF 115 (see § 1230.10(a)).

(b) *Film stock standards.* Polyester-based silver gelatin type film that conforms to ANSI/NAPM IT9.1-1996 for LE 500 film must be used in all applications.

(c) *Processing standards.* Microforms must be processed so that the residual thiosulfate ion concentration will not exceed 0.014 grams per square meter in accordance with ANSI/NAPM IT9.1-1996. Follow processing procedures in ANSI/AIIM MS1-1996 and MS23-1998.

(d) *Quality standards*—(1) *Resolution*—

(i) *Source documents.* Determine minimum resolution on microforms of source documents using the method in the Quality Index Method for determining resolution and anticipated losses when duplicating, as described in ANSI/AIIM MS23-1998 and MS43-1998. Perform resolution tests using a ISO 3334-1991 Resolution Test Chart or a commercially available certifiable target manufactured to comply with this standard, and read the patterns following the instructions of ISO 3334-1991. Use the smallest character used to display information to determine the height used in the Quality Index formula. A Quality Index of five is required at the third generation level.

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(ii) *COM*. Computer output microforms (COM) must meet the requirements of ANSI/AIIM MS1-1996.

(2) *Background density of images*. The background ISO standard visual diffuse transmission density on microforms must be appropriate to the type of documents being filmed. The procedure for density measurement is described in

ANSI/AIIM MS23-1998. The densitometer must meet with ANSI/NAPM IT2.18-1996, for spectral conditions and ANSI/NAPM IT2.19-1994, for geometric conditions for transmission density.

(i) Recommended visual diffuse transmission background densities for images of documents are as follows:

Classification	Description of document	Background density
Group 1	High-quality, high contrast printed book, periodicals, and black typing.	1.3-1.5
Group 2	Fine-line originals, black opaque pencil writing, and documents with small high contrast printing.	1.15-1.4
Group 3	Pencil and ink drawings, faded printing, and very small printing, such as footnotes at the bottom of a printed page.	1.0-1.2
Group 4	Low-contrast manuscripts and drawing, graph paper with pale, fine-colored lines; letters typed with a worn ribbon; and poorly printed, faint documents.	0.8-1.0
Group 5	Poor-contrast documents (special exception).	0.7-0.85

(ii) Recommended visual diffuse transmission densities for computer generated images are as follows:

Film Type	Process	Density Measurement Method	Min. Dmax <sup>1</sup>	Max. Dmin <sup>1</sup>	Minimum Density Difference
Silver gelatin	Conventional	Printing or dif-fuse	0.75	0.15	0.60
Silver gelatin	Full reversal	Printing	1.50	0.20	1.30

<sup>1</sup>Character or line density, measured with a microdensitometer or by comparing the film under a microscope with an image of a known density.

(3) *Base plus fog density of films*. The base plus fog density of unexposed, processed films must not exceed 0.10. When a tinted base film is used, the density will be increased. The difference must be added to the values given in the tables in paragraph (d)(2) of this section.

(4) *Line or stroke width*. Due to optical limitations in most photographic systems, film images of thin lines appearing in the original document will tend to fill in as a function of their width and density. Therefore, as the reduction ratio of a given system is increased, reduce the background density

as needed to ensure that the copies will be legible.

**§ 1230.16 What are the film and image requirements for temporary records, duplicates, and user copies?**

(a) *Temporary records with a retention period over 99 years*. Follow the film and image requirements in §1230.14.

(b) *Temporary records to be kept for less than 100 years*. NARA does not require the use of specific standards. Select a film stock that meets agency needs and ensures the preservation of the microforms for their full retention period. Consult appropriate ANSI standards, available as noted in §1230.3, or