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Document Name: AIMM MS5: Microfiche

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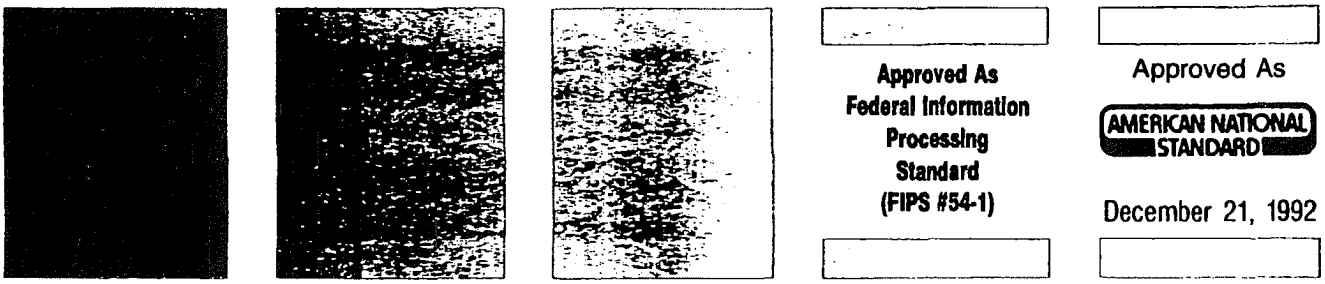
Standards Body: Association for Information and Image Management

APPROVED

Official Incorporator:
THE EXECUTIVE DIRECTOR
OFFICE OF THE FEDERAL REGISTER
WASHINGTON, D.C.

Microfiche

Standard



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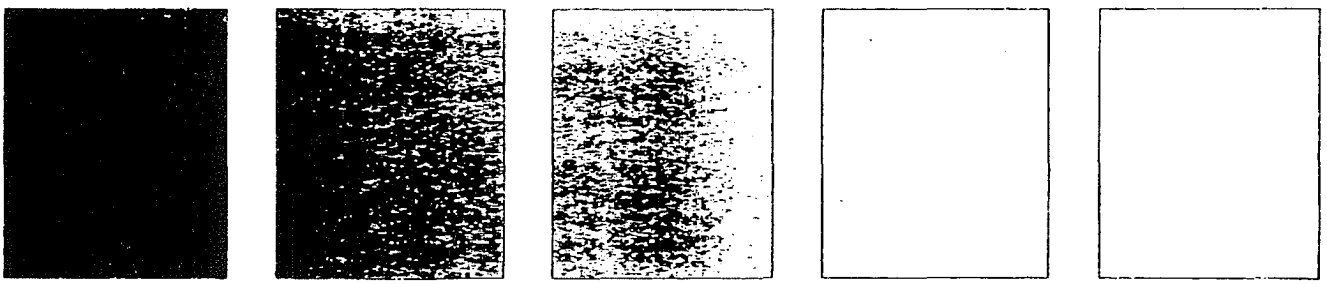
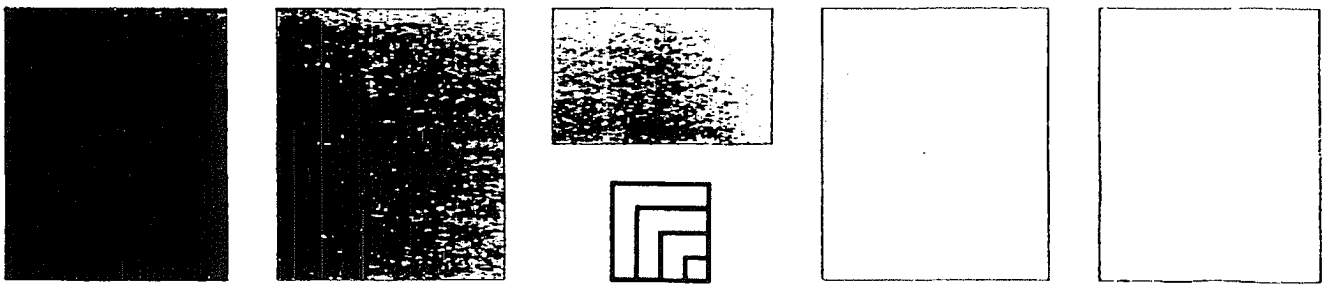
Federal Information Processing Standard (FIPS #54-1)

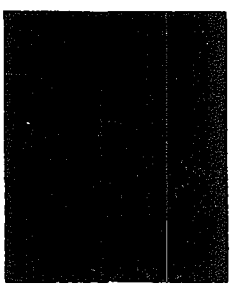
Approved As

AMERICAN NATIONAL STANDARD

December 21, 1992







ANSI/AIIM MS5-1992

AIIM

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This standard has been adopted for federal government use.

Details concerning its use within the federal government are contained in Federal Information Processing Standards Publication 54-1. For a complete list of the publications available in the Federal Information Processing Standards series, write to the Standards Processing Coordinator (ADP), National Institute of Standards and Technology, Gaithersburg, MD 20899.

ANSI/AIIM MS5-1992

Standard for Information and Image Management —

Microfiche

Association for Information and Image Management

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Foreword

(This foreword is not part of the American National Standard for Information and Image Management—Microfiche, ANSI/AIIM MS5-1992.)

Since the first American National Standard for Microfiche of Documents was completed in 1970, the micrographics field has seen major changes and advances in technology. Although this document was revised in 1975, the rapidly expanding use of microfiche and the need to recognize the accepted practices, procedures, and formats dictated its revision in 1991. A number of major factors influenced the changes that were made to the standard at that time.

This standard replaces ANSI/AIIM MS5-1991 which superseded ANSI/AIIM MS5-1985 and those portions of ANSI/AIIM MS2-1978 that referenced microfiche. First, some reduction ratios and microfiche formats have gained such wide acceptance as to constitute de facto standards. Over fifteen years ago, 1:48 was a rare reduction ratio for COM, much less for source document microfilming; today, it is commonplace. Although this standard recognizes the widespread use of 1:24 and 1:48 reductions and the associated microfiche formats, the continuing use of 1:20 and 1:42 reduction ratios is also acknowledged and retained in Appendix A. The use of other reduction ratios, such as 1:72, must also be noted; should their use become commonplace, their inclusion in an appendix or the body of the standard may be warranted in the future.

Second, the use of microfiche as computer-output microform has resulted in COM becoming one of the major sources of the microfiche medium. The benefits of compatible microfiche, no matter how produced, have also been recognized. As a result, one microfiche standard for both source documents and computer- output microfiche is now appropriate.

Third, much progress has been made in the area of quality control in both computer-output and source document microfilming. While this standard is not intended to duplicate or repeat the quality controls that are specified in other standards or practices, it is important to realize that microfiche formats and reduction ratios cannot be considered independent of quality requirements. Therefore, reference to such requirements is provided throughout this standard.

Fourth, the expanding use of microfiche in both private and public applications has increased the demand for information concerning accepted practices and procedures. Such information ranges from the seemingly simple areas of how to microfilm documents of different sizes within the accepted formats and reductions to the more complex

areas of dimensional tolerances and the effects of temperature and humidity. This standard, therefore, includes such guidance.

Finally, it should be noted that this standard does not purport to provide the only possible approach to the use of microfiche. Many other formats of microfiche are acceptable for various purposes. Microfiche with the entire microimaging area containing only one or a couple of microimages of maps or drawings are suitable for specialized applications. High and ultra-high reduction microfiche, produced in one or two steps, and duplicates of jacket microforms also are not discussed in this standard. For such applications, standards and technical reports are being developed or will be developed in the future.

Also, in 1992, the corner cut dimensions in this standard (Section 4.5.2 Corner Cuts) was modified to align with the dimensions in new, related international standards.

ISO 9923 Micrographics—Transparent A6 Microfiche Image Arrangements has been approved and publication is pending. ISO 9923 is a revision of ISO 2707-1980, ISO 2708-1980 and ISO 5126-1980. Dimensions contained in ANSI/AIIM MS5 are in accordance with those in ISO 9923.

A revision of ISO 4330-1987, Photography — Determination of the Curl of Photographic Film, is in process. It will replace ISO 4330-1987. This ISO 4330 standard will also most likely replace ANSI IT9.10-1991, For Imaging Media—Determination of the Curl of Photographic Film. Both ISO 4330 and IT9.10 are referenced standards for this version of MS5. It is also anticipated that ANSI Z39.32-1981, Information on Microfiche Headings, will undergo a revision in the near future. Additionally, ANSI/AIIM MS1, Recommended Practice for Alphanumeric Computer-Output Microforms—Operational Practices for Inspection and Quality Control, also referenced in this standard, is being revised by AIIM C4, Committee on Quality and Control.

Suggestions for changes or improvements to this standard are welcome and should be sent to the Chairman, AIIM Standards Board, Association for Information and Image Management, 1100 Wayne Avenue, Silver Spring, Maryland 20910.

At the time this standard was approved, the Standards Board of the Association for Information and Image Management had the following members:

Marilyn Courtot, *Chair*	Association for Information and Image Management
Thomas C. Bagg	National Institute of Standards and Technology
Thomas E. Berney	Consultant
Loretta D'Agnolo	American Express Company
Bruce Evans	3M Company
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Charles A. Plesums	USAA
George Thoma	National Library of Medicine
Charles F. Touchton	IBM Corporation
Herbert J. White II	Genealogical Society of Utah

The AIIM Supply Committee, C11, processed and approved this standard. The following were members of the committee at the time of approval:

Organization	**Representative**
Consultant	Thomas E. Berney, *Chair*
Air Force Material Command	Geo. Biach
Anacomp, Inc.	Don Klosterboer
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American National Standard for Information and Image Management — Microfiche, ANSI/AIIM MS5-1992

1. Scope

This standard applies to microfiche produced as a result of source document and computer-output microfilming. This standard does not preclude the use of other standards for unitized microforms.

2. References

All standards are subject to revision. When the following documents are superseded by an approved revision, that revision may apply.

2.1 Referenced American National Standards

ANSI/IT9.6-1991 (ISO 543), Photographic Films — Specifications for Safety Film.

ANSI/IT9.10-1991, Photography (Film) — Methods for Determining Curl.

ANSI/IT9.11-1991 (ISO 5466), Imaging Media — Processed Safety Film — Storage.

ANSI PH1.19-1990, Photographic Sheet Films—Designation of Emulsion Side.

ANSI PH1.43-1985, Photography (Film)—Processed Safety Film—Storage.

ANSI PH1.51-1990, Photography (Film)—Micrographic Sheet and Roll Film—Dimensions.

ANSI Z39.32-1981, Information on Microfiche Headings.

ANSI/AIIM MS1-1988, Information and Image Management—Recommended Practice for Alphanumeric Computer-Output Microforms—Operational Practices for Inspection and Quality Control.

ANSI/AIIM MS23-1991, Information and Image Management—Practice for Operational Procedures/Inspection and Quality Control of First Generation, Silver-Gelatin Microfilm of Documents.

ANSI/ISO 3334-1991 (ANSI/AIIM MS51-1991), Micrographics: ISO Test Chart No. 2 — Description and Use in Photographic Documentary Reproduction.

2.2 Other Referenced Standards

ISO 554-1976, International Standard for Atmospheres for Conditioning and/or Testing—Specifications.

ISO 4330-1987, International Standard for Photography—Determination of the Curl of Photographic Film.

2.3 Other Referenced Publications

AIIM TR2-1992, Technical Report for Information and Image Management — Glossary of Imaging Technology.

3. Definitions

The following definitions apply to terms that appear in this standard. Other terms are defined in AIIM TR2, Technical Report for Information and Image Management — Glossary of Imaging Technology.

Column. A vertical series of images on microfiche one single frame in width, and the height of that portion of the microfiche grid which is reserved for microimages.

COM. (Computer Output Microfilm) Technique for generation of microforms direct from computer output, either on-line or off-line.

Distribution Microfiche. The distribution microfiche is not defined in terms of generations. It is any microfiche intended for actual use, as distinct from camera and intermediate microfiche whose function it is to create microfiche for distribution. A distribution microfiche is a working copy that is expected to be filed, retrieved, and used. The normal use of a distribution microfiche may be for display on a reader, re-enlargment on a printer or reader-printer, or contact printing to produce a duplicate copy.

Frame. A rectangular area on the microfiche bounded by imaginary intersecting grid lines within which a microimage may be recorded. The grid lines shall be part of gauges used for checking microfiche, but they do not actually appear on the microfiche.

Frame, Single. A frame which is bounded by adjacent pairs of grid lines; the smallest subdivision of a grid.

Frame, Double. A combination of two horizontal, adjacent single frames.

Grid Line. An imaginary vertical or horizontal line which defines an edge of the frame boundary. The line is of zero width on the microfiche proper and does not infringe on the usable area of a single or double frame.

Heading. Inscription placed at the top of the microfiche to identify its contents. It is readable without magnification. It may also contain machine-readable information.

Heading Backing. An opaque or semi-opaque treatment applied to the back of the heading area to make the heading more readily visible by reflected light.

Imaginary Document. A document of the appropriate size that would have existed if the COM-generated microimage had been produced by source document microfilming.

Information Area. The area of a document that contains information, usually exclusive of the margin.

Margin, Document. In a document, the space between the information area and the edges of the sheet.

Microfiche. A transparent sheet of microfilm with microimages arranged in a grid pattern. A heading large enough to be read without magnification appears at the top of the microfiche in a space reserved for this purpose.

Microfiche Set. Two or more microfiche. A lead microfiche followed by one or more additional microfiche.

Quality Index. The subjective relationship between legibility of printed text and the resolution pattern resolved in a microimage. Note: used to pre-determine camera/microfilm requirements to ensure legibility in the resulting microimages.

Right-Reading. Orientation of text or images in normal sequence for reading, even if the material is rotated from an upright position. Right-reading is the opposite of reverse reading, which describes a mirror image. (See Figures 1a and 1b.)

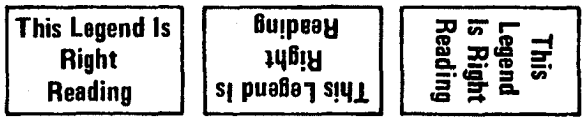

Figure 1a. Examples of Right Reading

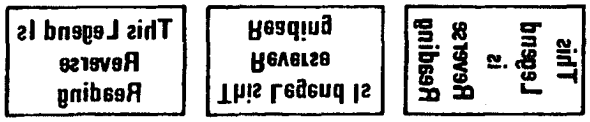

Figure 1b. Examples of Reverse Reading

Row. A horizontal series of microimages on a microfiche.

Source Document Microfilming. The conversion of documents, usually paper, to microimages.

4. Physical Characteristics of the Microfiche

4.1 General. Physical characteristics of the microfiche shall conform to ANSI PH1.51.

4.2 Sheet Size. Nominal sheet sizes shall be 105 mm × 148 mm (nominal ISO A6 size). See Figures 2 through 5 and Appendix D for tolerances and other information that could affect the dimensional characteristics.

4.3 Corner Rounding. The corners of any microfiche may be rounded, with the exception of those corners which were previously subjected to a corner cut. Where corner rounding is employed, the process shall not remove any more than 3 mm of either of the two sides which form the corner.

4.4 Cut-Off Corners. Where segments of an edge have been removed due to corner rounding or corner cuts, a straight line, extending the remainder of the edge in the relevant direction, shall constitute the basis for measuring dimensions and spacing.

4.5 Identification of the Sensitized Side. To facilitate microfiche-to-microfiche copying, a notch or corner cut may be used to identify the sensitized layer of a sheet of photographic film or of the microfiche. See ANSI PH1.19.

When a sheet of photographic film or a microfiche is held with the long side in a vertical position and a notch or cut is in the upper right hand corner, the sensitized side shall be toward the observer.

4.5.1 Notches. If a notch is used, it shall appear in one of the short edges of a sheet of photographic film or microfiche. In a microfiche, the edge in which the notch appears depends on the generation of the microfiche. The notches may be of any desired shape or number. They shall not penetrate more than 1.6 mm inward from the short edge of the sheet of photographic film or microfiche.

4.5.2 Corner Cuts. When a corner cut is used, it shall not exceed 4mm along the long dimension of the sheet of photographic film or the microfiche and 4mm along the short dimension. In a microfiche, the corner cut shall appear in the heading area only; the corner in which it appears depends on the generation of the microfiche.

4.6 Microfilm Thickness. The gross thickness ranges of microfiche, exclusive of the heading backing, if any, shall be:

Cellulose-acetate microfilm: 0.13 mm to 0.23 mm.
Polyester-base microfilm: The preferred thickness range is 0.10 mm to 0.23 mm. (A minimum

thickness of 0.08 mm is permissible, but not recommended.)[1]

4.7 Squareness and Edge Straightness of Sheets. The squareness and edge straightness of any given sheet of microfilm shall be limited by two perfect rectangles, one made to the minimum dimensional tolerance specified in ANSI PH1.51 and the other to the maximum tolerance. No point on the perimeter of the sheet shall fall within the smaller rectangle, nor shall any point fall outside the larger rectangle.

4.8 Curl and Bow. A fully processed microfiche, cut to distribution size, shall be placed "concave-side upward" on a flat surface for at least 6 hours in a 23° ± 3° C, 50 ± 5 percent relative humidity atmosphere (according to ISO 554), after which no part of the microfiche shall be more than 6.35 mm above the surface. See ANSI IT9.10 and ISO 4330.

4.9 Heading Backing. An opaque or semi-opaque backing for the heading area is optional and may cover the margins of the heading area, but shall not infringe on the grid area. If a heading backing is used, it shall not increase the thickness of the microfiche by more than 0.01 mm.[2]

4.10 Safety Film. The film used shall conform to ANSI IT9.6.

5. Types of Microfiche

5.1 General. Four standard microfiche formats are included. Table 1 summarizes the formats, document sizes, and reduction ratios to be used.

The individual frame position tolerances shown on the figures are not cumulative.

5.2 Arrangement of Frames

5.2.1 Microfiche formats 24/63 shall be a 63-frame format with 9 columns and 7 rows, as illustrated in Figure 2. The frame size shall be 15.5 mm × 12.5 mm.

5.2.2 Microfiche format 24/98 shall be a 98-frame format with 14 columns and 7 rows, as illustrated in Figure 3. The frame size shall be 10 mm × 12.5 mm.

5.2.3 Microfiche format 48/270 shall be a 270-frame format with 18 columns and 15 rows, as illustrated in Figure 4. The frame size shall be 7.75 mm × 6.25 mm.

5.2.4 Microfiche format 48/420 shall be a 420-frame format with 28 columns and 15 rows, as illustrated in Figure 5. The frame size shall be 5 mm × 6.25 mm.

5.3 Document or Imaginary Document Sizes

5.3.1 Microfiche formats 24/63 and 48/270 are formats designed for microfilming of 356 mm × 279 mm (14 inch x 11 inch) ledger size documents or computer-size imaginary documents. 24/63 is the preferred format for microfilming 356 mm × 279 mm (14 inch × 11 inch) ledger size documents or computer-size imaginary documents. 24/63 is the preferred format for microfilming 356 mm × 279 mm (14 inch × 11 inch) source documents. 48/270 is the preferred format for 256 mm × 279 mm (14 inch × 11 inch) COM-generated equivalents.

5.3.2 Microfiche formats 24/98 and 48/420 are formats designed for microfilming of 216 mm × 279 mm (8.5 inch × 11 inch) documents or imaginary documents. 24/98 is the preferred format for 216 mm × 279 mm (8.5 inch × 11 inch) COM-generated equivalents.

5.3.3 Other size documents, larger or smaller, can be microfilmed at reduction ranges shown in section 5.4. (See also Appendix E.)

5.4 Reduction Ranges

5.4.1 The nominal reduction for microfiche format 24/63 shall be 1:24. A reduction range of 1:19 to 1:26 is permissible, providing that the legibility and quality requirements of section 7.2 can be met.

5.4.2 The nominal reduction of microfiche format 24/98 shall be 1:24. A reduction range of 1:12 to 1:29 for source document microfilming and 1:23 to 1:26 for computer-output microfilming is permissible, providing that the legibility and quality requirements of section 7.2 can be met.[3]

5.4.3 The nominal reduction for microfiche format 48/270 shall be 1:48. A reduction range of 1:47 to 1:50 is permissible, providing that the legibility and quality requirements of section 7.2 can be met.

5.4.4 The nominal reduction for microfiche format 48/420 shall be 1:48. A reduction range of 1:32 to 1:50 for source document microfilming and 1:47 to 1:50 for computer-output microfilming is permissible, providing that the legibility and quality requirements of section 7.2 can be met.

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[1] Since there has been limited experience with this thin-base material, it is not possible to fully recommend its use. Users of the microfilm should be cautious regarding its use in automatic retrieval equipment; it also has the potential for image distortion.

[2] The use of such backing may restrict duplication. If the microfiche are to be maintained for a long life or permanent purposes, the backing materials, including adhesives, shall conform to ANSI PH1.43.

[3] The ISO A4 size is accommodated at 1:26; a legal size sheet at 1:29.

Table 1. Microfiche Formats, Documents Sizes, and Reductions

FORMAT	NO. OF FRAMES	FRAME SIZE	COLUMNS × ROWS	DOCUMENT SIZE	NOMINAL REDUCTION	REDUCTION RANGE	
						SOURCE DOCUMENTS	COM
24/63	63	15.5 × 12.5	9 × 7	356 × 279 (14 × 11)	1:24	1:19 to 1:26	1:19 to 1:26
24/98	98	10 × 12.5	14 × 7	216 × 279 (8.5 × 11)	1:24	1:12 to 1:29	1:23 to 1:26
48/270	270	7.75 × 6.25	18 × 15	356 × 279 (14 × 11)	1:48	1:47 to 1:50	1:47 to 1:50
48/420	420	5 × 6.25	28 × 15	216 × 279 (8.5 × 11)	1:48	1:32 to 1:50	1:47 to 1:50

1. Document size includes imaginary documents for COM.
2. Dimensions given in millimeters and (inches).
3. The reduction ranges for a given microfiche format should be used to accommodate documents of sizes different from those listed for that format. For documents that do not conform to the size listed, microfilming at the lower reduction ranges may cause the information area to exceed the microfiche frame area.
4. The microfiche formats, shown in the format column, are represented by two numbers which describe the type of microfiche by its nominal reduction and the number of microimage frames.

6. Microimage Placement and Orientation

6.1 Microimage Placement

6.1.1 Microimages shall be positioned within one of the grid patterns shown in Figures 2 through 5, whichever is appropriate.

6.1.2 The information area which is to appear in a microimage shall be positioned within individual, single or double, microfiche frames.

6.1.3 A margin of at least 0.13 mm should be left between the information area and the adjacent microfiche frame boundary. (See Appendix B.)

6.1.4 When the microfiche is held so that the heading is right-reading and upright, microimages shall always be right-reading and, whenever possible, upright.

6.1.5 If the text of the microimage is not upright on the microfiche, it shall appear on the microfiche rotated 90 degrees counterclockwise from the upright position.

6.2 Heading Placement. The minimum areas reserved for the heading are indicated in Figures 2 through 5 (microfiche formats 24/63, 24/98, 48/270 and 48/420) by shading. If additional heading space is required, the area dedicated to the next entire row or rows of microimages shall be used. When this option is utilized, row frame identification shall remain unchanged. The heading shall be used only for heading and identification purposes on all microfiche and shall not be used for microimages.

6.3 Contents of the Heading[4]

6.3.1 Identification Number. The document or identification number shall be in the extreme left portion of the heading area.

6.3.2 Alphanumeric Characters. All alphanumeric characters in the heading shall be upright and right-reading. (See Figure 1a.) The entries shall be readable without magnification.

6.3.3 Machine-readable Characters. The heading area may also contain machine-readable characters and optical codes. When used, machine-readable characters and optical codes shall be placed in the top right-most portion of the heading area, with the vertical dimensions not exceeding 6.25 mm.

6.3.4 Sequential Identification. When trailer microfiche are used, each microfiche in the set, including the first one, shall be sequentially identified. This information shall appear in the extreme right portion of the heading space or immediately below or to the left of any machine-readable characters or optical codes when these appear in the extreme right portion of the heading area.

[4] For bibliographic information on material produced for distribution to libraries and information centers, see ANSI Z39.32.

6.4 Pagination

6.4.1 First Frame. When the microfiche is held so that the heading is upright and right-reading, the first microimage, whether it is a test target or the first page of the document, shall be right-reading and in the upper left corner of the grid area in the frame immediately below the heading.

6.4.2 Succeeding Frames. Succeeding frames shall appear in sequence from left to right and downward in each succeeding row (horizontal pagination).

Vertical pagination is also permissible; in this case, the succeeding frames may appear in sequence from top to bottom and to the right in each succeeding column. (See also Appendix C.)

6.4.3 Location Index. An index to the grid location of the contents of a microfiche may be provided. If an index is provided, the first page of the index shall occupy the frame at the bottom right corner of the grid, as shown in Figures 2 through 5. If additional pages are required, they shall follow in sequence to the left or above the bottom right frame, depending upon the mode of pagination.

6.5 Frame Identification. Where coordinate identification is used for location of images, alphabetic characters shall be used to identify rows. Starting with the top row below the heading area, the first row shall be A, the second B, and so on, except when the heading extends into one or more rows of the image area, in which case the top row below the heading shall become B, C, etc., as appropriate.

Columns shall be identified by numerals. Starting at the reference corner (see Figures 2 through 5), the first column shall be 1, the second 2, and so on. The preferred location of the interframe identifier, when used, shall be the bottom center of each frame.

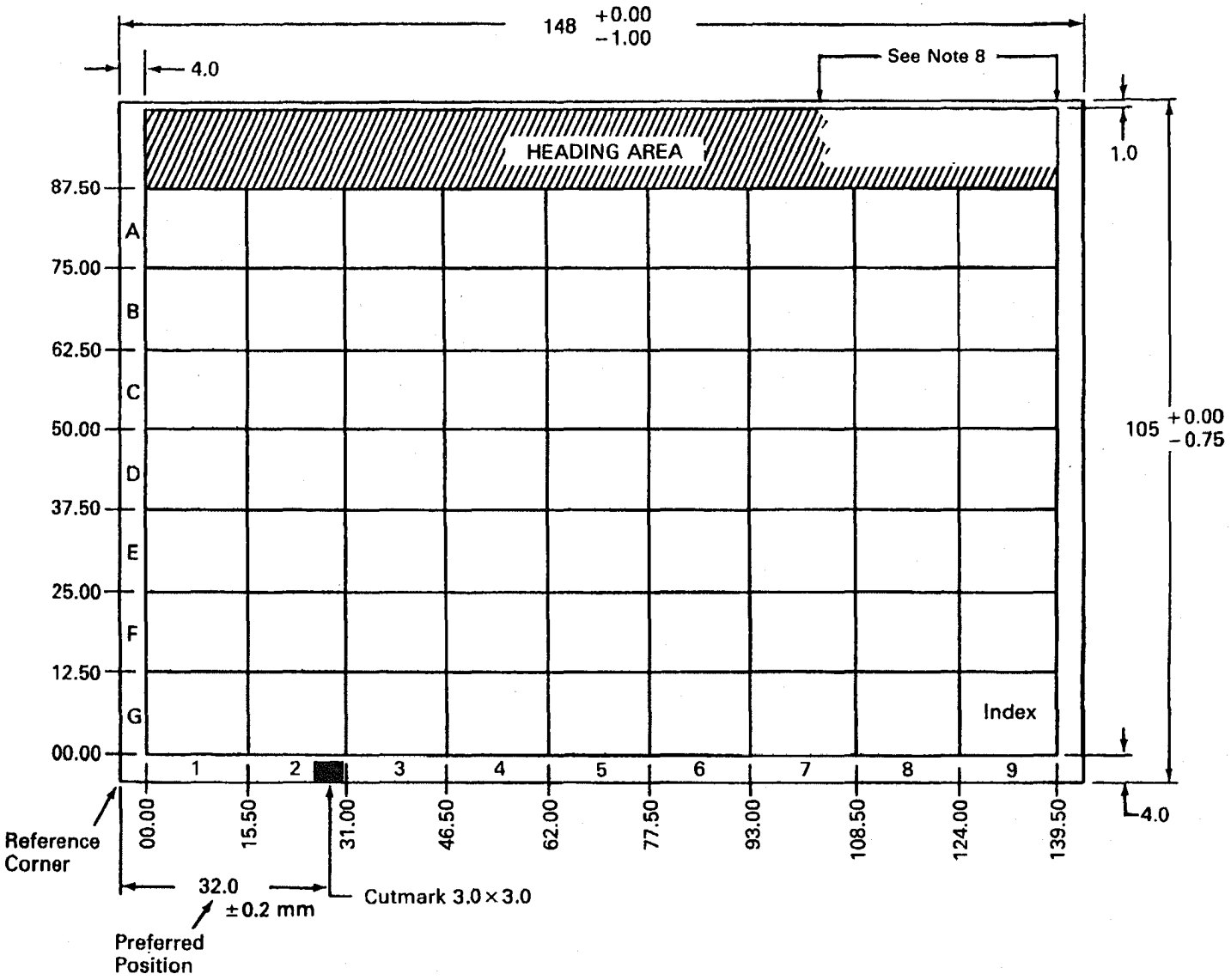
6.6 Cut Mark. Each microfiche should carry a cut mark to provide for automatic cutting of processed roll film into microfiche. This cut mark shall be 3.0 mm square and the preferred location of the center of the square shall be located 32.0 mm ± 0.2 mm from the left edge along the bottom edge of the microfiche.

6.7 Sectional Microfilming. If a document is too large to be microfilmed in a double frame, it shall be microfilmed in sections, with not less than 25 mm overlap of original material in accordance with Figure 6. If the document's image height can be accommodated in a double frame but is too wide for a single frame, the document shall be sectionalized in the manner shown in Figures 6a or 6b. If neither the height nor the width can be accommodated in a single or double frame, sectionalized microfilming of the document shall proceed as shown in Figure 6c.

7. Quality Control

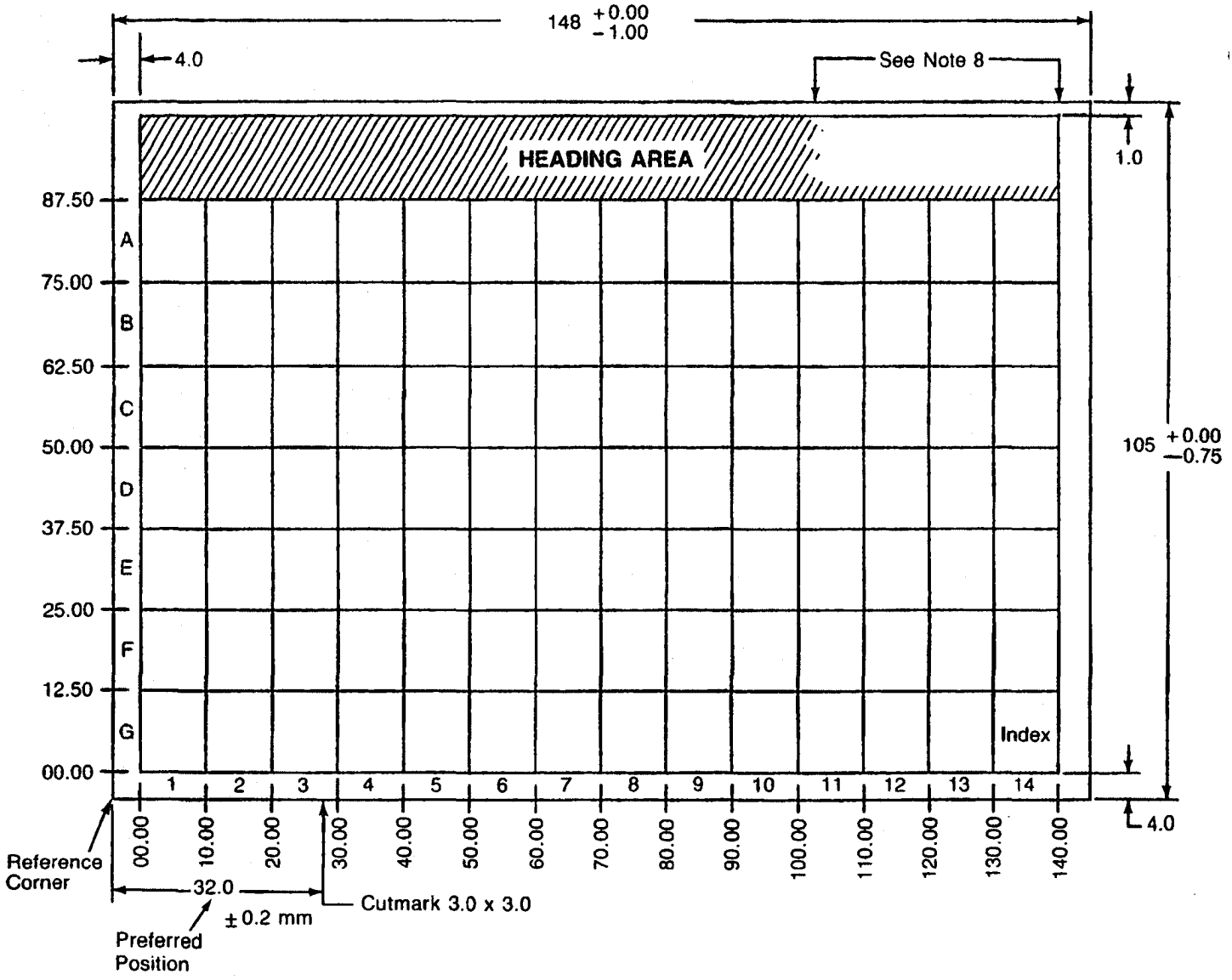
7.1 Quality Control Target. Each source document microfiche should contain a quality control target, unless the inclusion of such a target would make it necessary to add a trailer microfiche or an additional trailer microfiche to accommodate the original document. A test target, as described in ANSI/AIIM MS23 shall be used.

7.2 Quality Requirements. The legibility of the microimage of a source document shall be determined in accordance with the Quality Index method outlined and illustrated in ANSI/AIIM MS23. The quality index shall be equal to or greater than 3.6 (marginal quality) in the distribution copy. The method of reading the pattern resolved shall be as specified in ANSI/AIIM MS23. Quality requirements for computer-output microforms can be found in ANSI/AIIM MS1.



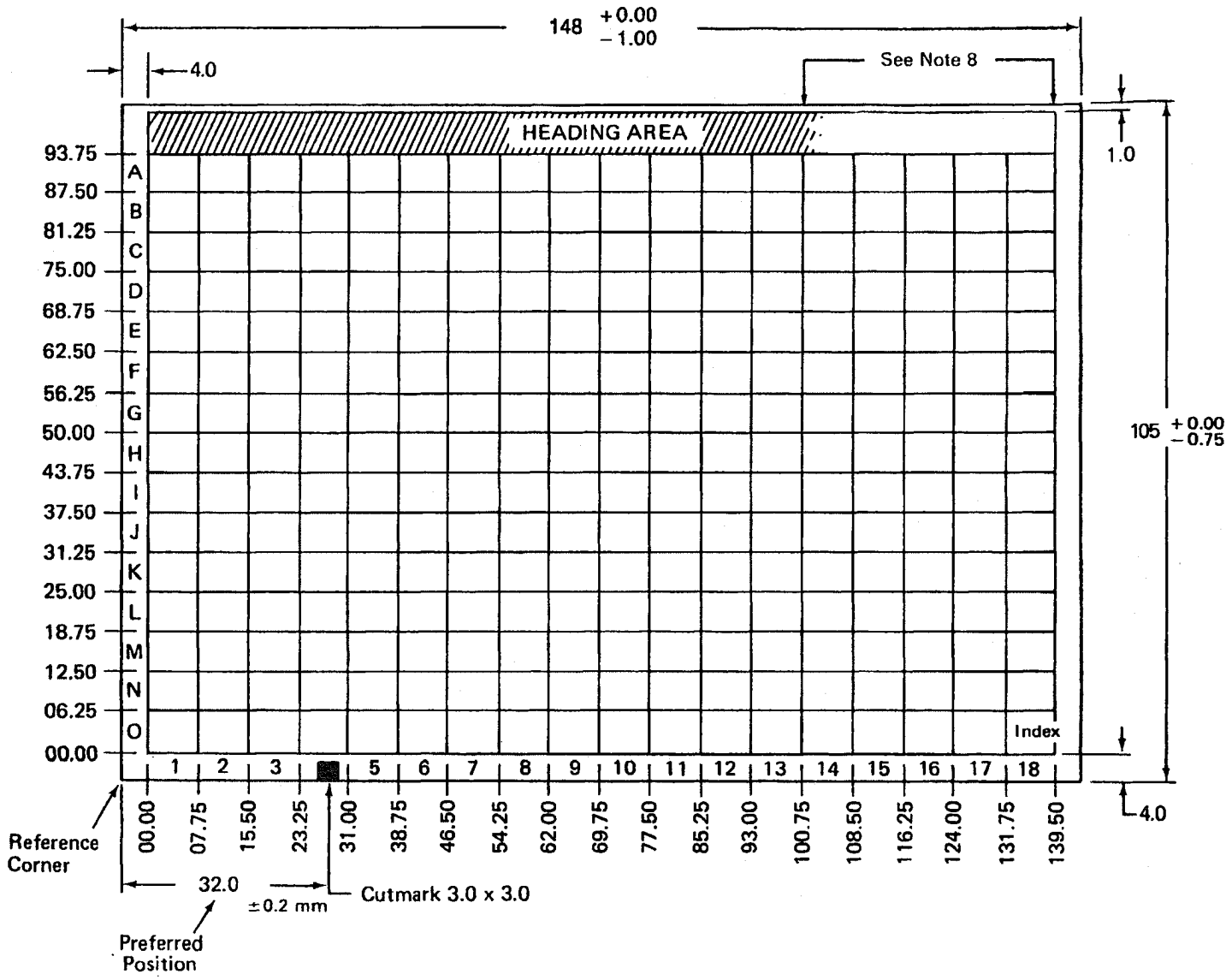
1. Format: 9 columns × 7 rows = 63 frames.
2. Nominal Reduction 1:24.
3. Dimensions in millimeters.
4. Grid lines shown do not appear on microfiche.
5. For location and dimensions of the notch or corner cut, see section 4.5.
6. Dimensions whose tolerances are not specified are ±0.5 mm.
7. Overall microfiche dimensions apply at time of rawstock cutting. (See Appendix D).
8. Area reserved for machine readable characters or optical codes (see Section 6.3.3).
9. Format dimensions apply at the time of exposure.

Microfiche Format 24/63
FIGURE 2



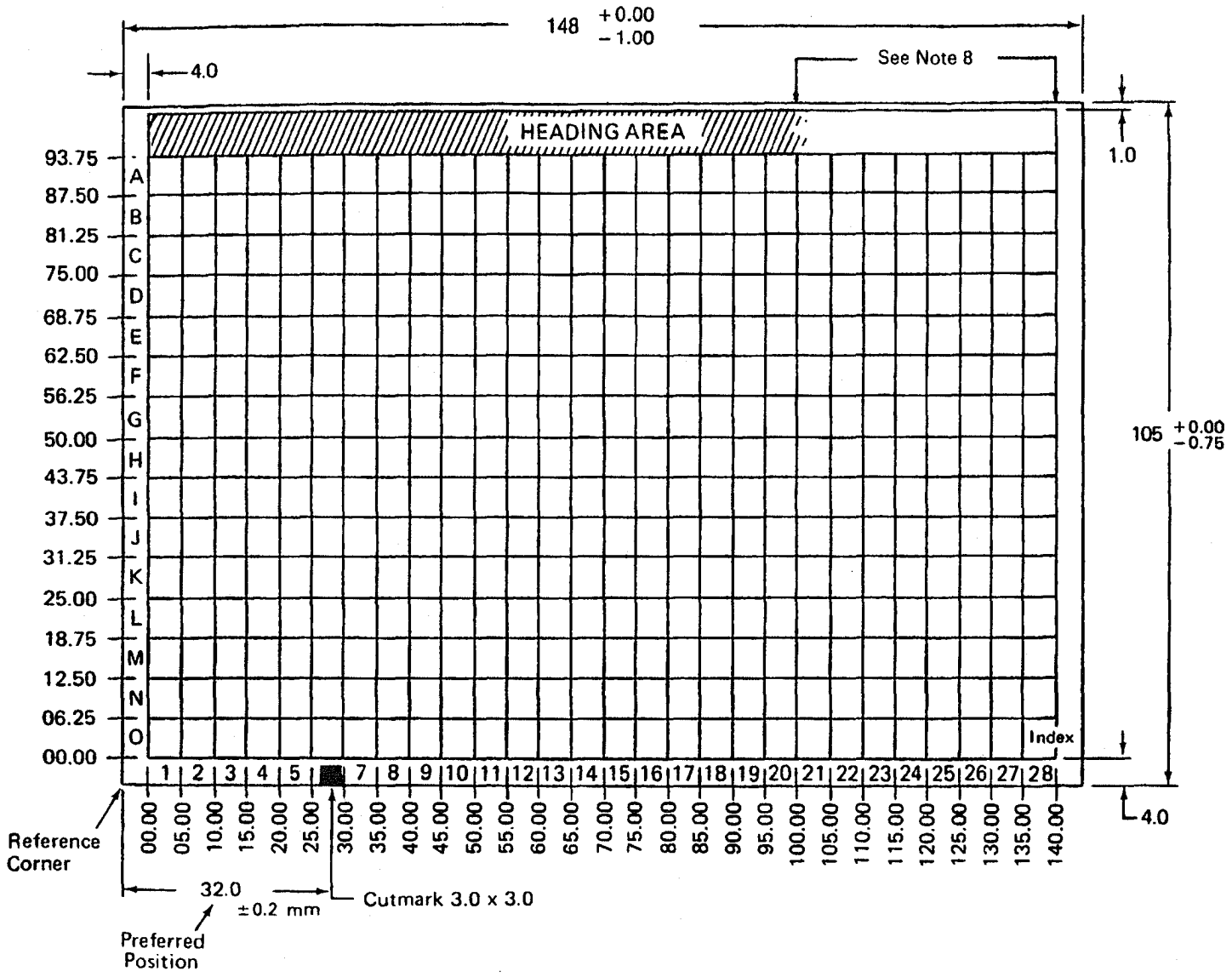
1. Format: 14 columns x 7 rows = 98 frames.
2. Nominal Reduction 1:24.
3. Dimensions in millimeters.
4. Grid lines shown do not appear on microfiche.
5. For location and dimensions of the notch or corner cut, see section 4.5.
6. Dimensions whose tolerances are not specified are ± 0.5 mm.
7. Overall microfiche dimensions apply at time of rawstock cutting. (See Appendix D).
8. Area reserved for machine readable characters or optical codes (see Section 6.3.3).
9. Format dimensions apply at the time of exposure.

Microfiche Format 24/98
FIGURE 3



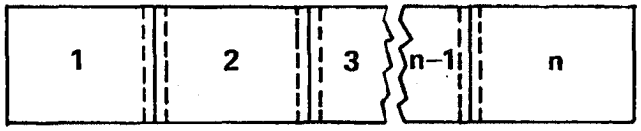
1. Format: 18 columns × 15 rows = 270 frames.
2. Nominal Reduction 1:48.
3. Dimensions in millimeters.
4. Grid lines shown do not appear on microfiche.
5. For location and dimensions of the notch or corner cut, see section 4.5.
6. Dimensions whose tolerances are not specified are ±0.5 mm.
7. Overall microfiche dimensions apply at time of rawstock cutting. (See Appendix D).
8. Area reserved for machine readable characters or optical codes (see Section 6.3.3).
9. Format dimensions apply at the time of exposure.

Microfiche Format 48/270
FIGURE 4

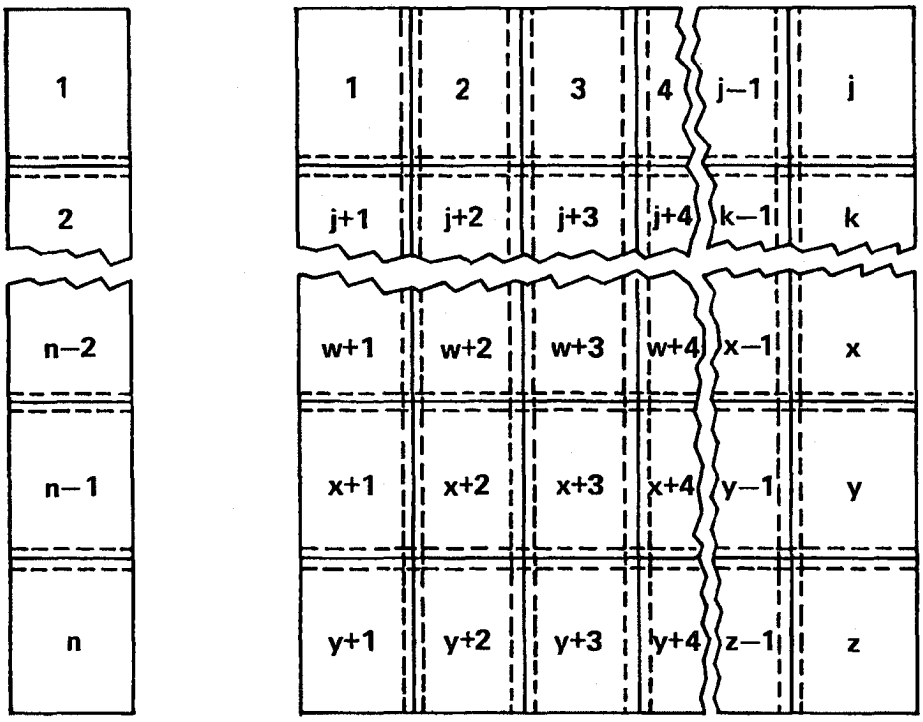


1. Format: 28 columns × 15 rows = 420 frames.
2. Nominal Reduction 1:48.
3. Dimensions in millimeters.
4. Grid lines shown do not appear on microfiche.
5. For location and dimensions of the notch or corner cut, see section 4.5.
6. Dimensions whose tolerances are not specified are ±0.5 mm.
7. Overall microfiche dimensions apply at time of rawstock cutting. (See Appendix D).
8. Area reserved for machine readable characters or optical codes (see Section 6.3.3).
9. Format dimensions apply at the time of exposure.

Microfiche Format 48/420
FIGURE 5



(a)



(b) (c)

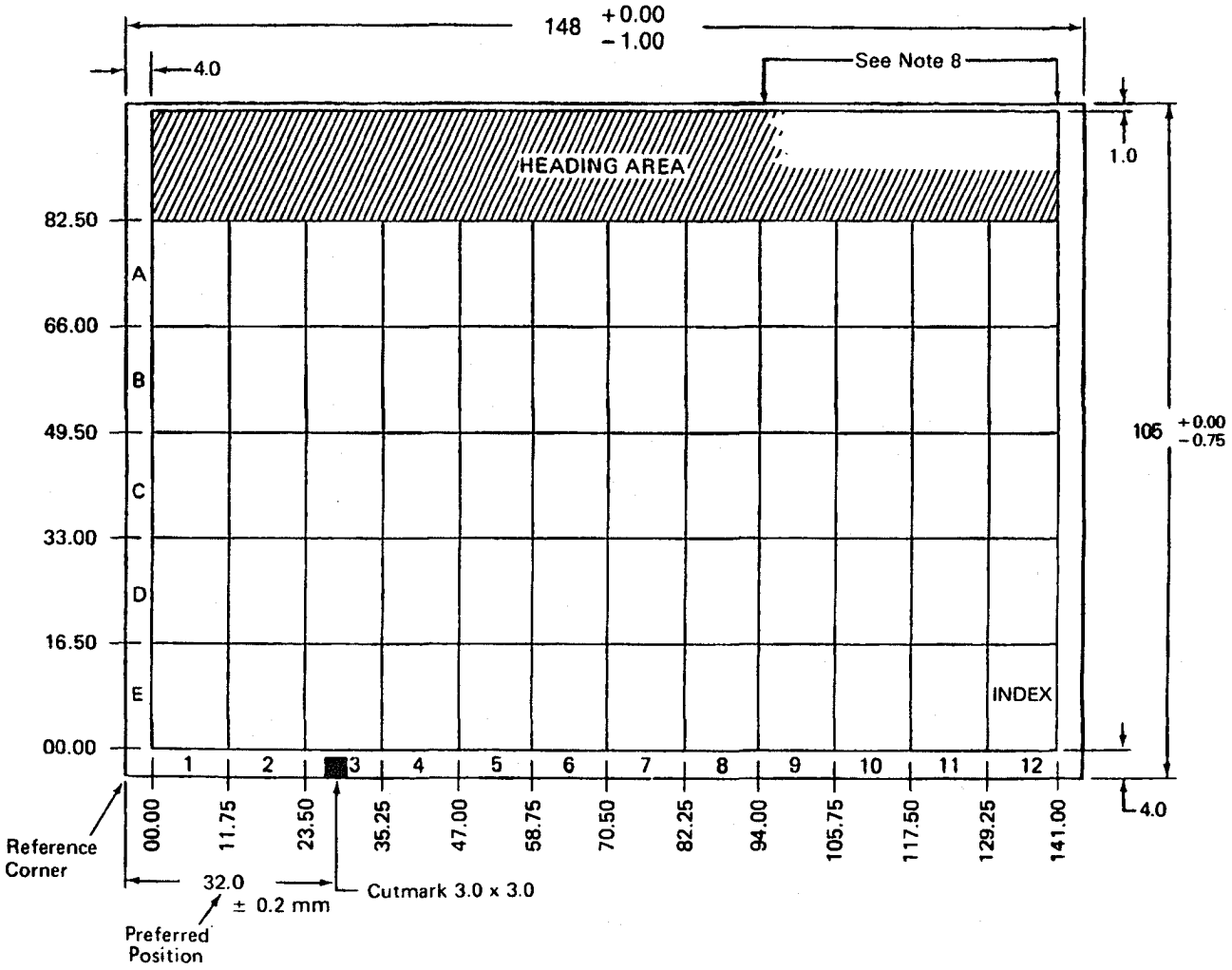
FIGURE 6
Sequences for Sectionalizing Documents

APPENDIX A
MICROFICHE FORMATS FOR 1:20 AND 1:42 NOMINAL REDUCTIONS

(This appendix is not part of American National Standard for Information and Image Management—Microfiche, ANSI/AIIM MS5-1992.)

A1. Microfiche Formats. Current usage of microfiche formats and effective reductions indicates the predominance of 1:24 and 1:48 over 1:20 and 1:42. Since both the latter reductions and corresponding microfiche formats may continue to be used, these formats are illustrated in Figures A1, A2, and A3.

A2. Requirements. Except for the formats, document sizes, and reductions, as summarized in Table A1, all requirements of this standard apply.



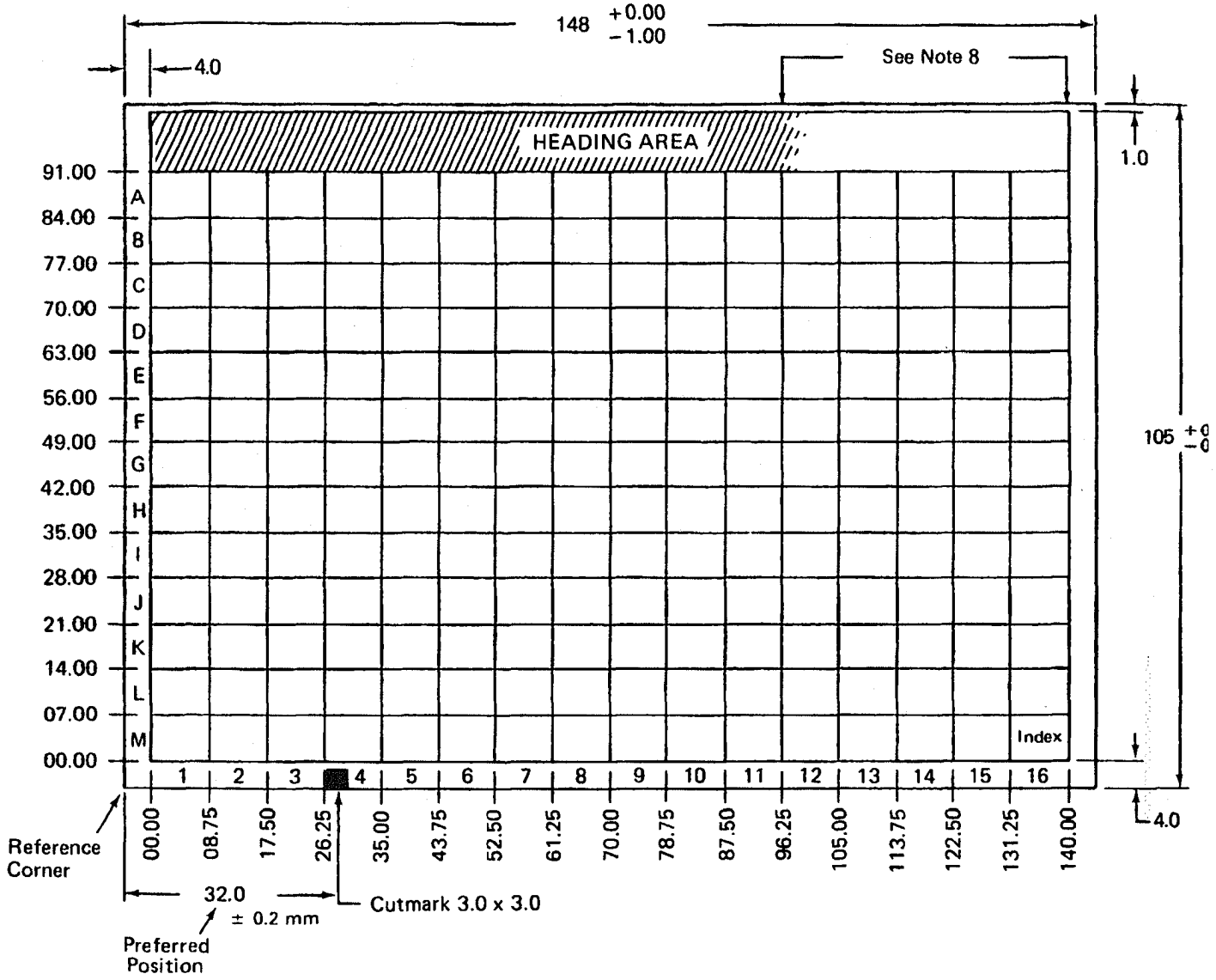
1. Format: 12 columns × 5 rows = 60 frames.
2. Nominal Reduction 1:20.
3. Grid lines shown do not appear on microfiche.
4. Dimensions in millimeters.
5. For location and dimensions of the notch or corner cut, see section 4.5.
6. Dimensions whose tolerances are not specified are ±0.5 mm.
7. Overall microfiche dimensions apply at time of rawstock cutting. (See Appendix D).
8. Area reserved for machine readable characters or optical codes (see Section 6.3.3).
9. Format dimensions apply at the time of exposure.

Microfiche Format 20/60
FIGURE A1

TABLE A1
MICROFICHE FORMATS, DOCUMENT SIZES, AND REDUCTIONS

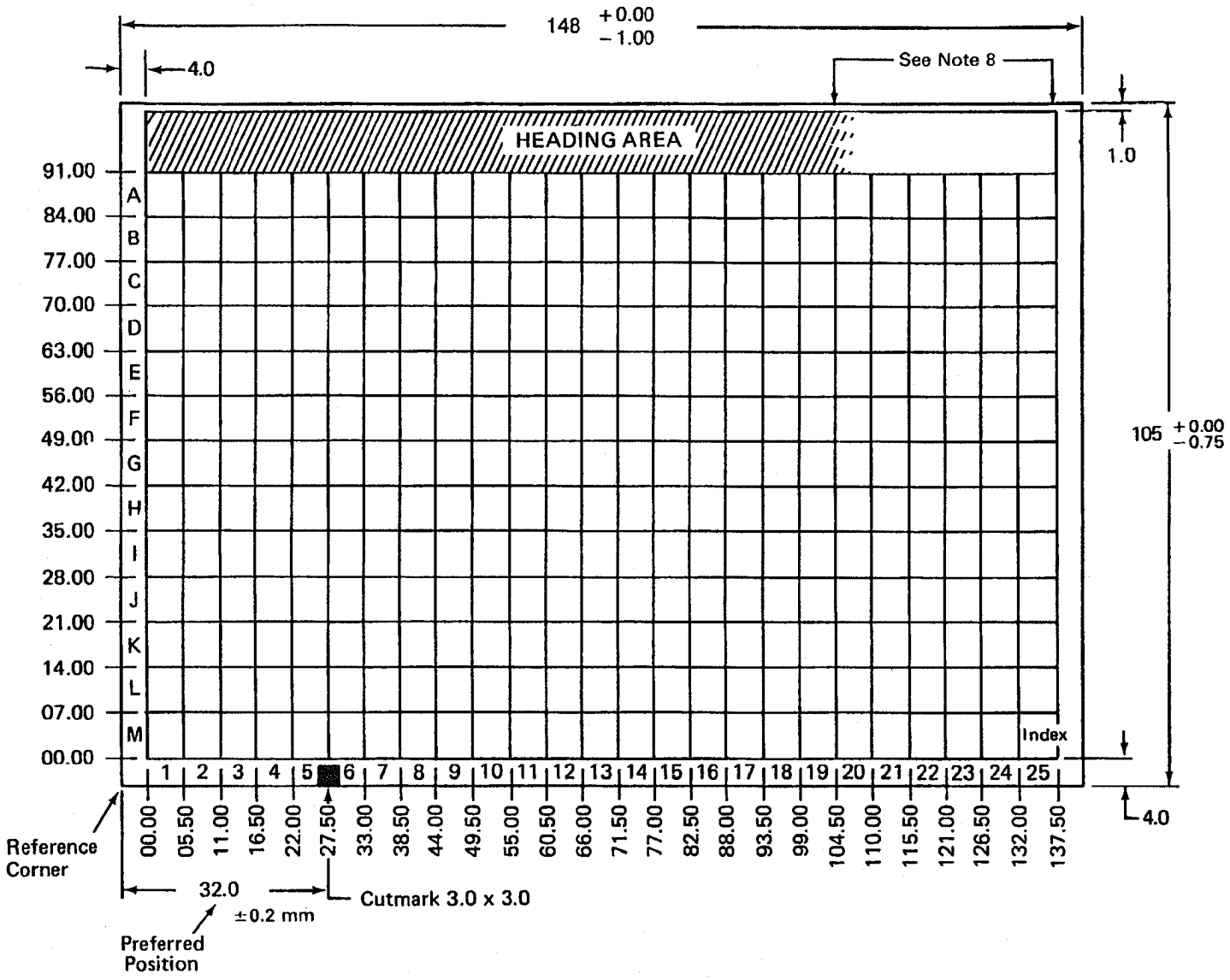
FORMAT	NO. OF FRAMES	FRAME SIZE	COLUMNS X ROWS	DOCUMENT SIZE	NOMINAL REDUCTION	REDUCTION RANGE	
						SOURCE DOCUMENTS	COM
20/60	60	11.75 X 16.5	12 X 5	216 X 279 (8.5 x 11)	1:20	1:12 to 1:26	not for COM
42/208	208	8.75 x 7	16 x 13	256 x 279 (14 x 11)	1:42	1:41 to 1:44	1:41 to 1:44
42/325	325	5.5 x 7	25 x 13	216 x 279 (8.5 x 11)	1:42	1:30 to 1:46	1:41 to 1:44

1. Document size includes imaginary documents for COM.
2. Document sizes given in millimeters and (inches).
3. The reduction ranges for a given microfiche format should be used to accommodate documents of sizes different from those listed for that format. For documents that do not conform to the size listed, microfilming at the lower reduction ranges may cause the information area to exceed the microfiche frame area.
4. The microfiche formats, shown in the format column, are represented by two numbers which describe the type of microfiche by its nominal reduction and the number of microimage frames.



1. Format: 16 columns × 13 rows = 208 frames.
2. Nominal Reduction 1:42.
3. Dimensions in millimeters.
4. Grid lines shown do not appear on microfiche.
5. For location and dimensions of the notch or corner cut, see section 4.5.
6. Dimensions whose tolerances are not specified are ±0.5 mm.
7. Overall microfiche dimensions apply at time of rawstock cutting. (See Appendix D).
8. Area reserved for machine readable characters or optical codes (see Section 6.3.3).
9. Format dimensions apply at the time of exposure.

Microfiche Format 42/208
FIGURE A2



1. Format: 25 columns × 13 rows = 325 frames.
2. Nominal Reduction 1:42.
3. Dimensions in millimeters.
4. Grid lines shown do not appear on microfiche.
5. For location and dimensions of the notch or corner cut, see section 4.5.
6. Dimensions whose tolerances are not specified are ±0.5 mm.
7. Overall microfiche dimensions apply at time of rawstock cutting. (See Appendix D).
8. Area reserved for machine readable characters or optical codes (see Section 6.3.3).
9. Format dimensions apply at the time of exposure.

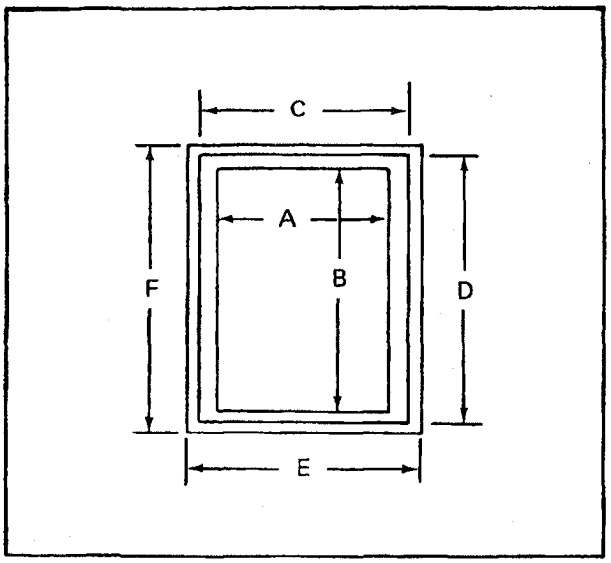
Microfiche Format 42/325
FIGURE A3

APPENDIX B
Nominal Image and Frame Dimensions for Microfiche Formats

(This appendix is not part of American National Standard for Information and Image Management—Microfiche, ANSI/AIIM MS5-1992.)

Figures B1 and B2 and Tables B1 and B2 are provided for guidance in placement of images for both 216 mm × 279 mm (8.5 inch × 11 inch) and 356 mm × 279 mm (14 inch × 11 inch) page or equivalent page sizes, within the microfiche frames specified in this standard and in Appendix A.

Table and Figure B1
Nominal Image & Frame Dimensions
Dimensions 216 × 279 mm (8.5 × 11 inch) page or equivalent page size
(Refer to Table B1)

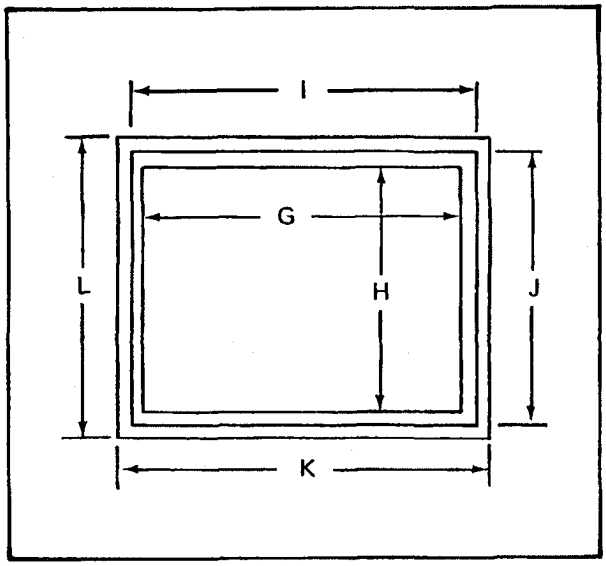


Dimensions†	Nominal Reductions Full*	1:20	1:24	1:42	1:48
A	177.800 (7.000)	8.89 (0.35)	7.420 (0.292)	4.240 (0.167)	3.710 (0.146)
B	271.020 (10.667)	13.550 (0.533)	11.300 (0.445)	6.450 (0.254)	5.640 (0.222)
C	215.900 (8.500)	10.795 (0.425)	9.000 (0.354)	5.130 (0.202)	4.500 (0.177)
D	279.400 (11.000)	13.970 (0.550)	11.640 (0.458)	6.650 (0.262)	5.820 (0.229)
E	— —	12.000 (0.473)	10.000 (0.394)	5.500 (0.217)	5.000 (0.197)
F	— —	15.000 (0.590)	12.500 (0.492)	7.000 (0.276)	6.250 (0.246)

†Dimensions A and B represent text (for COM, 70 characters per line times 64 lines per page). Dimensions C and D represent page size (8½ × 11 inches). Dimensions E and F represent imaginary grid lines. All dimensions are nominal.

*All dimensions are given in millimeters; figures in parentheses are inch equivalents.

Table and Figure B2
Nominal Image & Frame Dimensions
Dimensions 356 × 279 mm (14 × 11 inch) page or equivalent page size
(Refer to Table B2)



Dimensions†	Nominal Reductions Full*	1:20	1:24	1:42	1:48
G	335.280 (13.200)	16.764 (0.660)	13.970 (0.550)	7.980 (0.314)	6.990 (0.275)
H	271.020 (10.667)	13.551 (0.533)	11.300 (0.445)	6.450 (0.254)	5.640 (0.222)
I	355.600 (14.000)	17.788 (0.700)	14.810 (0.583)	8.460 (0.333)	7.420 (0.292)
J	279.400 (11.000)	13.970 (0.550)	11.640 (0.458)	6.650 (0.262)	5.820 (0.229)
K	— —	18.600 (0.732)	15.000 (0.610)	8.750 (0.344)	7.750 (0.305)
L	— —	15.000 (0.590)	12.500 (0.492)	7.000 (0.276)	6.250 (0.246)

†Dimensions G and H represent text (for COM, 132 characters per line times 64 lines per page). Dimensions I and J represent page size (14 × 11 inches). Dimensions K and L represent imaginary grid lines. All dimensions are nominal.

*All dimensions are given in millimeters; figures in parentheses are inch equivalents.

Appendix C. Pagination Modes

(This appendix is not part of the American National Standard for Information and Image Management—Microfiche, ANSI/AIIM MS5-1992.)

C1. Pagination for COM. It is recognized that there is a requirement for both vertical and horizontal pagination. The proper choice depends on an evaluation of the pertinent criteria:

1. Compatibility of generated microfiche with existing files.

2. Application-oriented factors, such as:
   a. The nature and structure of the information generated, e.g., text versus listings;
   b. Human factors relating to reading comfort;
   c. Unforeseen requirements related to new microfiche applications;
   d. Listings without vertical frame breaks.

3. Hardware factors that influence COM microfiche pagination are related to:
   a. The mode obtainable from the available COM equipment;
   b. Conversion from COM roll microfilm to COM microfiche, through jackets or strip-up;
   c. The selected storage and retrieval system.

C2. Pagination for Source Documents. When producing microfiche as a result of source document microfilming, vertical pagination may occasionally be appropriate. However, in general, such pagination is not recommended.

C3. Selection of Pagination Mode. The selection of the optimum mode (vertical or horizontal) should result from the system analysis.

Appendix D. Dimensional Tolerances

(This appendix is not part of the American National Standard for Information and Image Management—Microfiche, ANSI/AIIM MS5-1992.)

D1. Raw Stock Microfilm. The dimensions of the sheet and roll raw stock at the time of cutting by the manufacturer are specified in ANSI PH1.51. The dimensions for sheet film specified in the above standard are:

Microfilm	Millimeters
105 mm by 148 mm	105 + 0.0 − 0.75 by 148 + 0.0 — 1.00

D2. Processing Dimensional Changes. The dimensions of the microfilm immediately after processing cannot be predicted with great accuracy because there are many variables. The films may stretch or shrink depending on the emulsion, support, moisture content, film tension in the processor, and the time and temperature of processing. It is estimated that silver-gelatin or diazo-sensitized microfilms coated on polyester base may stretch or shrink approximately ±0.01 percent. Vesicular and thermally processed silver microfiche on polyester base can change from 0 to 0.5 percent. A simultaneous swell (normally in the 105-mm dimension) and shrink (normally in the 148-mm dimension) in different directions can occur on a single microfiche.

D3. Aging Dimensional Changes. The shrinkage of the processed microfiche with aging depends on the conditions of storage and the type of support. Films coated on polyester support show considerably less shrinkage than films coated on cellulose ester.

It is estimated that microfilm on polyester base may shrink approximately 0.01 to 0.03 percent over a 10-year period. The shrinkage of films coated on cellulose-ester support depends on the rate of loss of residual solvents from the support. The shrinkage of these films may be between 0.1 to 0.7 percent after 10 years of storage.

D4. Effects of Temperature and Humidity. Microfiche will become larger with increases in either temperature or humidity. The changes are temporary or reversible. Cellulose ester-base films will change approximately 0.006 percent for each degree Celsius, while polyester-base films will change approximately 0.002 percent. For each percent of relative humidity, cellulose ester-base films will change approximately 0.004 percent, while polyester-base films will change 0.001 to 0.002 percent, depending on the film type.

D5. Microfiche Grid Dimensional Change. The dimensions of the microfiche, at any time in its useful life, are the sum of the variations due to processing and aging in addition to the raw stock dimensions. It should be noted that changes in size due to processing and aging will affect the location of the images relative to the microfiche grid. The effect these factors will have on the location of a specific image relative to the grid will be proportional to the distance the image is from the reference corner of the microfiche. This may affect some automatic retrieval devices.

APPENDIX E
Alternative Reduction Ratios

[This appendix is not part of the American National Standard for Information and Image Management—Microfiche, ANSI/AIIM MS5-1992.)

The following ratios will accommodate the stated document sizes and fill one 10.0 mm × 12.5 mm frame of the 24/98 microfiche format. Certain reductions will accommodate multiple pages in a single frame.

REDUCTION RATIO	DOCUMENT WIDTH	DOCUMENT HEIGHT	COMMENTS
1:12 1:13 1:14	120 mm (4.7 in) 130 mm (5.1 in) 140 mm (5.5 in)	150 mm (5.9 in) 162.5 mm (6.3 in) 175 mm (6.8 in)	
1:15 1:16 1:17	150 mm (5.9 in) 160 mm (6.2 in) 170 mm (6.6 in)	187.5 mm (7.3 in) 200.0 mm (7.8 in) 212.5 mm (8.3 in)	Preferred reduction for 5 × 7 inch pages.
1:18 1:19 1:20	180 mm (7.0 in) 190 mm (7.4 in) 200 mm (7.8 in)	225.0 mm (8.8 in) 237.5 mm (9.3 in) 250.0 mm (9.8 in)	Preferred reduction for 7 × 9 inch pages.
1:21 1:22 1:23	210 mm (8.2 in) 220 mm (8.6 in) 230 mm (9.0 in)	262.5 mm (10.3 in) 275.0 mm (10.8 in) 287.5 mm (11.3 in)	
1:24 1:25 1:26	240 mm (9.4 in) 250 mm (9.8 in) 260 mm (10.2 in)	300.0 mm (11.8 in) 312.0 mm (12.3 in) 325.0 mm (12.7 in)	Preferred reduction ratio for 8½ × 11 inch pages. A4 size page
1:27 1:28 1:29	270 mm (10.6 in) 279 mm (11.0 in) 290 mm (11.4 in)	337.5 mm (13.2 in) 350.0 mm (13.7 in) 362.5 mm (14.2 in)	Preferred reduction for 11 × 8½ inch pages. Legal-size pages

The following reduction ratios will accommodate the stated document sizes and fill one 5 × 6.25 mm frame of the 48/420 microfiche format.

REDUCTION RATIO	DOCUMENT WIDTH	DOCUMENT HEIGHT	COMMENTS
1:32 1:34 1:36	160 mm (6.2 in) 170 mm (6.6 in) 180 mm (7.0 in)	200.0 mm (7.8 in) 212.5 mm (8.3 in) 225.0 mm (8.8 in)	Preferred reduction for 5 × 7 inch pages.
1:38 1:40 1:42	190 mm (7.4 in) 200 mm (7.8 in) 210 mm (8.2 in)	237.5 mm (9.3 in) 250.0 mm (9.8 in) 262.5 mm (10.3 in)	Preferred reduction for 7 × 9 inch pages.
1:44 1:46 1:48	220 mm (8.6 in) 230 mm (9.0 in) 240 mm (9.4 in)	275.0 mm (10.8 in) 287.5 mm (11.3 in) 300.0 mm (11.8 in)	Preferred reduction ratio.
1:50	250 mm (9.8 in)	312.0 mm (12.3 in)	