

**Standard Recommended
Practice for Alphanumeric
Computer-Output
Microforms-Operational
Practices for Inspection
and Quality Control**

ANSI/AIIM MS1-1996

Approved As

American National
Standards Institute (ANSI)
Standard

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Standard for Information and Image Management —

Standard Recommended Practice for Alphanumeric Computer–Output Microforms — Operational Practices for Inspection and Quality Control

Association for Information and Image Management International

Abstract:

This standard provides guidelines and recommended practices for the quality control of Computer Output Microfilm (COM) produced on recorders using fixed “Hard” form slides. Quality control procedures, recommended criteria, and corrective guidance are provided.

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Foreword (This foreword is not part of American National Standard for Information and Image Management — Recommended practice for alphanumeric computer-output microforms — Operational practices for inspection and quality control, ANSI/AIIM MS1-1996).

This standard is a revision of ANSI/AIIM MS1-1988. The revision is necessary because new standards have been issued and referenced standards have been changed since the previous edition of MS1. In addition, other changes have been made to improve the presentation of information. No major technical changes have been made. The clauses on image life have been revised to reflect changes to the expected life of different media, including a new life expectancy for thermally processed silver film. The method for quality control remains the same. Use of the method described in this document has proven to be effective in establishing and controlling quality limits. Further, the method has been relatively easy to institute and use.

This standard is a companion to ANSI/AIIM MS39. Whereas ANSI/AIIM MS39 covers standards for graphic computer-output microfilm (COM) quality, this standard covers alphanumeric COM quality.

In order to maintain a historic perspective, much of the information published in the foreword of the original standard, ANSI/AIIM MS1-1981, is reprinted here.

As the use of computer-output microfilm continued to grow in the 1970s and as the applications became more sophisticated, it became obvious the community needed to establish useful methods for prescribing film and image quality for achieving consistent, acceptable results. Also it was recognized that the requirements for COM recorders functioning principally as computer line printer equivalents (alphanumeric) were significantly different in several aspects from the requirements for graphic COM recorders (such as those used in generating engineering drawings and graphic arts output). Although both types of recorders have certain characteristics in common, graphic recorders must accurately produce geometric shapes, graphs, and three-dimensional views along with dimensions and multiple size characters. The principal concerns with alphanumeric recorders, however, are legibility and the duplication characteristics of printed text.

After evaluating user requirements, the COM Quality Standards Committee concluded that a quality standard for alphanumeric COM was not feasible and that a recommended practice would fully satisfy user needs. This recommended practice addresses equipment, supplies, and operational procedures related to alphanumeric COM used for business and government records. Included are recommendations related to

- legibility,
- first-generation camera films and subsequent-generation duplicating films,
- film processing,
- form slide quality (including original artwork),
- image density,
- film stability,
- film storage.

A test method for use in establishing and maintaining consistent image quality is included. Specifications for the form slide used to test for image quality are given in ANSI/AIIM MS28, *Alphanumeric COM quality test slide*.

This recommended practice is not intended to be an all-inclusive quality control document. Its purpose is to supply information useful in maintaining the quality of alphanumeric COM. For general and more inclusive quality control information covering first-generation and duplicate microforms, the user should refer to ANSI/AIIM MS23, *Practice for operational procedures/inspection and quality control of first generation, silver-gelatin microfilm of documents* and ANSI/AIIM MS43, *Recommended practice for operational procedures/inspection and*

quality control of duplicate microforms of documents and from COM.

This recommended practice is confined to effective reduction ratios up to and including 1:48. Because reduction ratios higher than 1:48 have not yet been standardized, this recommended practice does not address quality considerations for such image sizes.

Of singular importance in alphanumeric COM filming is the legibility of the information supplied to users. Obviously, if the information is not legible, it has no value. So, the most important guidelines to establish are for legibility, with less emphasis on other characteristics. Because consideration of all possible COM systems and system configurations is virtually impossible, this recommended practice attempts to create general guidelines that can significantly increase the probability of consistently acceptable results.

When microfilming hardcopy documents, planetary and rotary camera test targets are used to monitor resolution and density. In COM recorders that use a form slide containing fixed data, resolution targets are used in the form slide to establish optimum focus, but they do not provide a measure of character resolution or legibility obtained from the image generator. Although character quality from the image generator cannot be measured using resolution targets, the characters can be compared to an image of a reference form slide in the same frame to establish a relative quality level. After evaluating several methods for establishing quality limits for COM images, it was concluded that the use of the sans serif characters E and H provided the easiest means for establishing and maintaining quality. The characters E and H were chosen because they contain both horizontal and vertical lines common to most fonts used in COM regardless of the method of character generation. Although there may be differences in aspect ratio (character height to width ratio) and the location of the central horizontal lines in various COM recorders, the similarities are adequate for benchmark comparisons. The letters E and H represent simple shapes that are very easy to compare; however, the more complex and similar symbols such as % and @, B and 8, S and 5, Z and 7, and M and W need to be examined and proper records kept to assure adequate legibility.

Proper COM performance requires controlling both character and background optical density to ensure satisfactory duplication of the camera film. This recommended practice gives values covering line and background densities for both first generation camera film and subsequent generation duplicate film.

The COM quality test form slide used in this recommended practice contains density squares large enough to allow measurement of the film density using an ordinary densitometer equipped with a 1 mm aperture. Although measurement of the large area density does not determine character line density, it is very useful in maintaining consistent exposure from the form slide. The form slide exposure can then be compared to the exposure from the image generator to maintain proper exposure of the alphanumeric characters.

This recommended practice also includes guidelines for the preparation of the various form slides used to record fixed data. These guidelines should be followed if satisfactory results are expected. The most common cause of unsatisfactory COM output, and the most frequent image-quality complaint of users, is the use of improperly designed form slides.

Any suggestions for improving this recommended practice are welcome and should be sent to the Chair, AIIM Standards Board, Association for Information and Image Management International, 1100 Wayne Avenue, Suite 1100, Silver Spring, Maryland 20910-5603.

At the time this revised recommended practice was approved, the AIIM Standards Board had the following members:

Name of Representative Organization Represented

Marilyn Wright, <i>Chair</i>	Association for Information and Image Management, International
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John C. Gale	Information Workstation Group
Bruce A. Holroyd	Eastman Kodak Company
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Shahzad S. Qazi	Eastman Kodak Company
Michael L. Thomas	MSTC, Inc.
Stephen Urban	Delta Information Systems, Inc.

Committee C23, Micrographics Technology, had the following members at the time it approved this revised recommended practice:

Name of Representative Organization Represented

Don M. Avedon, <i>Chair</i>	Avedon Associates, Inc.
Carl J. Anderson	3M
Michael J. Badal	Badal Associates

<u>Name of Representative</u>	<u>Organization Represented</u>	<u>Name of Representative</u>	<u>Organization Represented</u>
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Masanobu Kurokawa	Fuji Photo Film USA		

American National Standard for Information and Image Management

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

1 Scope

This recommended practice describes operational and quality control guidelines for alphanumeric computer-output microfilm (COM) recorders and microforms using black-and-white film as well as duplicates made from such films. The scope of this recommended practice is limited to images of line printer equivalent output only, such as those used for business and government records. The scope is further limited to COM recorders using a form slide for recording fixed data. As such, it does not cover COM recorders using so-called software forms.

This recommended practice covers microforms containing data generated by dynamic energy sources, such as cathode ray tubes, lasers, and light emitting diodes; and fixed data, such as that contained on a form slide, with effective reduction ratios up to and including 1:48. The subjects covered include a method for comparing the legibility of the dynamic information to that contained in an image of the alphanumeric COM quality test form slide when exposed on the same frame and duplicated onto silver, diazo, or vesicular films. The films, film processing, film storage, film density practices and guidelines for preparing form slide artwork and form slides are also discussed.

This standard does not cover COM recorders generating images from bitmaps or data streams incorporating images, variable fonts, graphics, or imbedded objects.

2 Normative references

2.1 Referenced American national standards

ANSI IT9.1:1992, Imaging media (film) — Silver-gelatin type — Specifications for stability.

ANSI IT9.2:1991, Imaging media — Processed photographic films, plates, and papers — Filing enclosures and containers for storage.

ANSI IT9.5:1992, Imaging media (film) — Ammonia-processed diazo films — Specifications for stability.

ANSI IT9.6:1993, Imaging media — Photographic films — Specification for safety film.

ANSI/NAPM IT9.11:1993, Imaging media — Processed safety photographic film — Storage.

ANSI/NAPM IT9.12:1995, Imaging material — Processed photographic vesicular film — Specifications for stability.

ANSI/ISO 417:1993 (ANSI/NAPM IT9.17:1993), Photography — Determination of residual thiosulfate and other related chemicals in processed photographic materials — Methods of using iodine-amylose, methylene blue and silver sulfide.

ANSI/ISO 5-2:1991, Photography — Density measurements — Part 2: Geometric conditions for transmission density.

ANSI/ISO 5-3:1984, Photography — Density measurements — Part 3: Spectral conditions.

ANSI/ISO 3334:1989 (ANSI/AIIM MS51:1991), Micrographics — ISO resolution test chart No. 2 — Description and use in photographic documentary reproduction.

ANSI/AIIM MS23:1991, Information and image management — Microfilm of documents — Operational procedures/inspection and quality control of first generation, silver-gelatin microfilm of documents.

ANSI/AIIM MS28:1996, Information and image management — Micrographics — Alphanumeric COM quality test slide.

ANSI/AIIM MS43:1988 (A1991), Information and image management — Recommended practice for operational procedures/inspection and quality control of duplicate microforms of documents and from COM.

2.2 Related publications

ANSI/AIIM TR2:1992, Technical Report for the Association for Information and Image Management — Glossary of imaging technology.

AIIM TR3:1981, Technical Report for the Association for Information and Image Management — Thermally processed silver microfilm.

3 Definition

The following definition applies to terms used in this standard. Other terms pertaining to this document shall be defined as stated in *ANSI/AIIM TR2, Technical Report for the Association for Information and Image Management — Glossary of imaging technology*.

3.1 Silver-gelatin film Wet-processed, silver-halide film with silver as the image-forming material and with a gelatin binder (matrix).

4 Microfilm types

4.1 General

The most commonly used first-generation microfilms are silver-gelatin film and thermally processed silver film. Duplicating films are diazo, vesicular, and silver-gelatin. See figure 1 for COM-generation terminology.

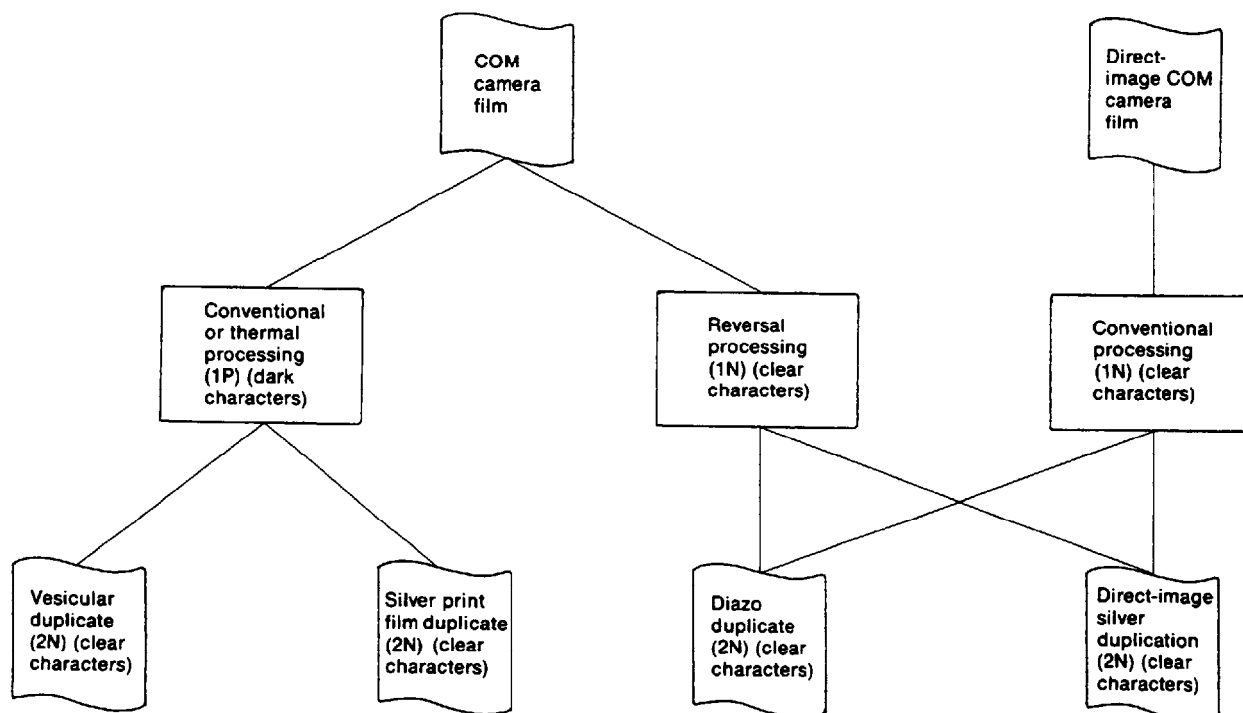


Figure 1 — COM-generation terminology