



# **GPO Contract Terms**

## **Quality Assurance through Attributes Program for Microforms**

Prospective suppliers should carefully read this publication as the applicable articles stated herein become an integral part of microform contracts with the U.S. Government Publishing Office. A printed copy should be retained for reference.

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Note: Previously used names of these attributes are in *italic* in parentheses.

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## Introduction

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This document defines the quality requirements of microforms through the use of standards, permissible tolerances, and measurement methods for quality characteristics which describe customer needs and expectations.

The document pertains to all microform types procured by the U.S. Government Publishing Office. The end use of these microforms is to be any or all of the following:

- Producing additional microforms; producing hard copy blowback (paper prints); and viewing on micrographic viewing equipment, including automated retrieval systems.
- Definitions, procedures, and defect classification tables are based upon standards published by the American National Standards Institute (ANSI), the Association for Information and Image Management (AIIM), and Military Specifications and Standards (MIL-STD).

When any of these standards are referenced in this document they will be listed by their acronym.

## Definitions

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**Acceptable Quality Level.** The AQL for each lot is the maximum number of defects per 100 units of product that the Government will accept at the contract price.

**Critical Defect.** A defect that renders a microform unusable for its intended end use or affects its longevity.

**Extended Term Storage.** Storage conditions suitable for the preservation of recorded information having permanent value.

**Generation.** One of the successive stages of photographic reproduction of an original or a master. The first generation is the camera film. Copies made from this first generation are second generation and so on.

**Information.** A specified item, such as but not limited to, a character, word, or image in the header or image area.

**Inspection Levels.** The means used to determine the relationship between the lot size and the sample size. Inspection levels will be specified in the contract in accordance with MIL-STD-105. Unless otherwise specified, General Inspection Level I will be used for nondestructive tests and Special Inspection Level S-2 will be used for destructive tests.

**Inspection Lot.** A collection of units of product, for each generation, from which a sample is to be drawn and inspected to determine conformance to specifications. The lot for microform contracts will normally be all of the microforms produced, for that generation, under one order.

**LE Designation.** A rating for the “life expectancy” of recording materials and associated retrieval systems. The number following the LE symbol is a prediction of the minimum life expectancy expressed in years for which information can be retrieved without significant loss when stored under specified storage conditions. For example, LE-100 indicates that information can be retrieved after at least 100 years of storage.

**Life Expectancy.** Film stability classified according to an “LE rating” specifying the length of time that information is predicted to be retrievable in a system when stored under specified storage conditions.

**Major Defect.** A deviation from specifications which could result in a customer complaint.

**Microfiche.** Microfiche measure 148mm in length and 105mm in width and contain multiple microimages arranged in a grid pattern in the image area. A heading appears at the top of the microfiche in a space reserved for this purpose and is large enough to be read without magnification.

**Quality Attribute.** A property or characteristic of a microform which affects its quality.

**Retrievability.** The ready access to information as recorded.

**Standard Viewing Conditions.** The appraisal of color quality and color uniformity as defined in Part 1, ANSI PH2.30.

**System.** Consists of recording materials, hardware, software, and documentation necessary to retrieve information.

**Units of Product.** The items, for example, frames or microfiche, inspected in order to determine their classification as defective or nondefective.

## Determination of Product Quality

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Product quality is evaluated for each attribute by comparing its measured value with the tolerance specified for that attribute. When each microform is inspected, each applicable attribute that deviates from specification is classified as either a critical defect or a major defect, in accordance with the tolerance table for that attribute.

The AQL for microforms produced from good quality source documents or from print image tapes, for major defects, is 6.5 unless otherwise stated in the contract. The AQL may be loosened for poor quality source documents or tightened based upon customer requirements. There is no AQL for critical defects.

Defects will not be assessed for deviations from specifications which are caused by the furnished material if the contractor notifies the Government prior to production that the furnished material is not satisfactory.

The following attributes will not be evaluated when duplicate microforms are produced from the furnished microforms: Cut Mark; Format; Grid Alignment; Image Layout; Index Placement; and Reduction Ratio.

Attributes which are not identified as quality attributes under the Microforms Attributes Program will be evaluated in accordance with Article 1, Quality, Supplemental Specifications, U.S. Government Publishing Office Contract Terms, GPO Pub. 310.2.

## Determining Acceptability

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Inspection of all microforms is usually impractical, therefore the Government will utilize statistical sampling to determine acceptability. For an explanation of acceptance sampling reference GPO Technical Report No. 27.

When no instrument is listed in an attribute description, randomly selected microfiche and microfiche frames will be visually inspected to determine acceptability. The numbers of frames to inspect is dependent upon the AQL and the numbers of frames present on an individual microfiche. When the numbers of frames equal or exceed the reject criteria identified in MIL-STD-105, evaluate the microfiche according to the attribute's defect classification table.

**Example:** An order consists of 151 microfiche. The AQL is 6.5 and a sample of 13 microfiche were selected from the order-General Inspection Level I, Code Letter E, MIL-STD-105. Of the 13 selected microfiche, 12 had between 26 and 98 frames and the 13th had 11 frames. For each of the 12 microfiche, inspect 8 randomly selected frames-General Inspection Level I, Code Letters C and D, MIL-STD-105. If 2 or more frames for each microfiche do not conform to the attribute tolerance, assess a defect to each affected microfiche. For the 13th microfiche inspect 2 randomly selected frames and if 1 or both frames do not conform to the attribute tolerance, assess a defect to that microfiche-General Inspection Level I, Code Letter A, MIL-STD-105.

An order will be accepted at the contract price when the Government determines that either there are no known critical defects or the number of major defects for each lot does not exceed the specified AQL. MIL-STD-105 will be used to make this determination.

The Government may request a 100 percent inspection of an order at any time under any conditions. At the discretion of the Government, the contractor may be required to inspect every microform of each lot for critical defects. The right is reserved to inspect every microform submitted by the contractor and to reject the order immediately when or if a critical defect is found. The right is also reserved to sample every lot of each order submitted by the contractor and to reject the order if a sample is found to contain one or more critical defects.

The right is reserved to reject any microform found defective during inspection whether that microform constitutes part of a sample or not, and whether the order as a whole is accepted or rejected. With the approval of, and in the manner specified by the Government, rejected microforms may be repaired, corrected, or replaced, and resubmitted for inspection.

If a critical defect is found, or if the number of major defects for an inspection lot exceeds the AQL, the Government will have the option of:

- Rejecting the entire order and having the defective lot(s) replaced;
- Requiring the contractor to inspect the defective lot(s) and replace all defective items; or
- Accepting the rejected order with an equitable reduction in the contract price.

Failure to agree to the amount of such reduction of price will be a dispute concerning a question of fact within the meaning of Article 5, Disputes, Contract Clauses, U.S. Government Publishing Office Contract Terms, GPO Pub. 310.2.

All transportation costs related to replacing rejected items or the rejected order(s) will be borne by the contractor.

## Modifications to Attribute Tolerances

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Attribute tolerances may be modified for an individual contract provided that there is justification for the change. Such changes must be stated in the body of the contract. For example, source documents containing halftones, colored paper, poor quality microforms, duplicates to be produced from nonsilver microforms, or poor quality text will normally require modification to the density requirements. Modifications should be the result of data obtained from preliminary tests.

## Aperture Card

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### Definitions

A card with one or more rectangular openings specifically prepared for the mounting or insertion of microfilm. Provides a combination of key punched data and access information with microfilm.

**Sources** ANSI/AIIM MS9, MS10, MS41; ANSI X3.11; MIL-STD-804, MIL-C-9877, and MIL-M-38761.

### Instruments

- Ruler with a scale graduated in increments of 0.1 mm or 0.005 inch.
- Optical comparator with a scale graduated in increments of 0.1 mm or 0.005 inch.
- A gauge with a 0.0025 mm or 0.0001 inch measuring capability.

## Procedure

- Reference the methods described in the standards listed under Sources.
- Assess a defect or defects in accordance with the Defect Classification Table.

## Defect Classification Table for Aperture Card

Defect	Classification
Card dimensions not as specified	Critical
Card stock not as specified	Critical
Information not as specified	Critical
Location of information not as specified	Critical
Aperture position not as specified	Critical
Aperture dimensions not as specified	Critical
Color stripe missing	Critical
Physical damage to a master aperture card	Critical
Corner cut missing or improperly located	Critical
Corner cut measurement not as specified	Critical
Buildup area thickness greater than 0.01 mm	Critical
Microfilm carrier is on wrong side of card	Critical
Corners of card not as specified	Major
Color of card not as specified	Major
Color stripe not as specified	Major
Document image orientation not as specified	Major
Physical damage to a duplicate aperture card	Major

## Character Fidelity

### Definitions

Individual alpha and numeric characters, special characters or symbols that are capable of being read or deciphered.

**Sources** None.

**Instruments** Microform reader.

### Procedure

- Place the microform in the reader and view it at a magnification of 100 percent of the effective reduction.
- Glide the microform through the reader.
- Stop at a specific frame, all frames, or the required number of randomly selected frames as determined by MIL-STD-105. Defects may include, but are not limited to: filled-in, broken, blurred, dark, weak or faded characters.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Character Fidelity

Defect	Classification
Character defects in frames, not present in the supplied material, that equal or exceed the reject criteria of MIL-STD-105 or exceed the AQL times the number of frames on the microform	Major
More than 5 character defects in the heading area that were not present in the supplied material	Major

## Cut Mark

### Definitions

A square optical mark, located on the bottom edge of a microfiche at the lower left (reference) corner. Added to film at the time of exposure to permit the automatic cutting of processed roll film into microfiche. Not applicable to distribution copies.

**Sources** ANSI/AIIM MS5.

### Instruments

Optical comparator with a scale graduated in increments of 0.1 mm or 0.005 inch. Procedure

- Measure the distance from the reference corner of the microfiche to the left edge of the cut mark.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Cut Mark

Defect	Classification
Position of cut mark less than 30.3 mm (1.19 inch)	Major
Position of cut mark greater than 30.7 mm (1.21 inch)	Major

## Density

### Definitions

**Density.** The light-absorbing or light-reflecting quality characteristics of a photographic image usually expressed as the logarithm of the opacity.

**Background Density.** The opacity of the noninformation area of a microform.

**Minimum Density (Dmin).** The lowest transmission or projection density obtainable in a processed film, base-plus-fog.

**Base-Plus-Fog.** The transmission density of a film which has not been exposed but which has been developed and fixed.

**Sources** ANSI/AIIM MS1, MS23, and MS43; ANSI PH2.18 and ANSI PH2.19.

**Instruments** Transmission densitometer.

**Procedure**

- Background Density. Measure three areas of the microform that are free of information.
- Dmin Density (Base-Plus-Fog). Measure three unexposed processed areas on the microform.
- Average the three readings for background density and Dmin.
- Assess a defect in accordance with the Defect Classification Table.

*NOTE 1.* Density of silver-gelatin and diazo microfiche will be measured on a densitometer with a 1 mm aperture and a visual filter.

*NOTE 2.* Density of vesicular microfiche will be measured on a densitometer using the F/4.5 projection glass with a 1 mm aperture and a visual filter.

*NOTE 3.* All densities must be measured from an area large enough to completely fill the aperture of the densitometer.

**Defect Classification Table for Density**

**Negative Silver-Gelatin Camera Masters Produced from Source Documents**

Defect	Classification
Background density less than 0.95 or greater than 1.25	Major
Dmin greater than 0.10	Major

**Second Generation, Negative Silver-Gelatin Direct-Duplicate Intermediate Microforms Produced from First Generation, Negative Silver-Gelatin or Supplied Microforms**

Defect	Classification
Background density less than 1.10 or greater than 1.70	Major
Dmin less than 0.00 or greater than 0.20	Major

**Third Generation, Negative Silver-Gelatin Direct-Duplicate Intermediate Microforms Produced from Second Generation, Negative Silver-Gelatin or Supplied Microforms**

Defect	Classification
Background density less than 1.15 or greater than 1.55	Major
Dmin less than 0.10 or greater than 0.20	Major

**Positive Silver-Gelatin Second Generation, Positive Silver-Gelatin Print Intermediate Microforms Produced from First Generation, Negative Silver-Gelatin or Supplied Microforms**

Defect	Classification
Line density less than 1.20 or greater than 1.50	Major
Dmin less than 0.10 or greater than 0.20	Major

**Third Generation, Negative Silver-Gelatin Print Intermediate Microforms Produced from Second Generation, Positive Silver-Gelatin or Supplied Microforms**

Defect	Classification
Line density less than 1.10 or greater than 1.40	Major
Dmin less than 0.10 or greater than 0.20	Major

**Diazo Diazo Duplicate Microforms, Second Generation or Higher, Negative (Background)/Positive (Line) produced from a silver microform**

Defect	Classification
Background/line density less than 1.30	Major
Dmin greater than 0.10 maximum	Major

**Vesicular Vesicular Duplicate Microforms, Second Generation or Higher, Negative (Background)/Positive (Line) produced from a silver microform**

Defect	Classification
Background/line density less than 1.60	Major
Dmin less than 0.10 or greater than 0.20	Major

**These density values are for Computer Output Microfilm (COM) Negative Silver-Gelatin First Generation, Negative Silver-Gelatin Camera Masters**

Defect	Classification
Background density less than 1.50	Major
Dmin greater than 0.20 plus base	Major

### Second Generation, Negative Silver-Gelatin Direct-Duplicate Intermediate Microforms

Defect	Classification
Background density less than 1.50	Major
Dmin less than 0.14 or greater than 0.18	Major

### Second Generation, Negative Silver-Gelatin Print Intermediate Microforms

Defect	Classification
Background density less than 1.50	Major
Dmin greater than 0.10	Major

### Positive Silver-Gelatin First Generation, Positive Silver-Gelatin Camera Masters

Defect	Classification
Dmin greater than 0.10 plus base	Major

### First Generation, Positive Thermally Processed Silver Camera Masters

Defect	Classification
Dmin greater than 0.40 plus base Dmin less than 0.10 or greater than 0.20	Major

### Second Generation, Positive Silver-Gelatin Direct-Duplicate Intermediate Microforms

Defect	Classification
Dmin less than 0.14 or greater than 0.18	Major

### Second Generation, Positive Silver-Gelatin Print Intermediate Microforms

Defect	Classification
Dmin greater than 0.10	Major

### Diazo Second Generation or Higher, Negative (Background)/Positive (Line) produced from a silver microform

Defect	Classification
Background/line density less than 1.30	Major
Dmin greater than 0.15 plus base	Major

### Vesicular Second Generation or Higher, Negative (Background)/Positive (Line) produced from a silver microform

Defect	Classification
Background/line density less than 1.80	Major
Dmin greater than 0.15 plus base	Major

## Film Color

### Definitions

The spectral response resulting from the reflection and transmission of light.

**Sources** None.

**Instruments** None.

### Procedure

- Visually inspect the microform for its film color at standard viewing conditions.
- Assess a defect in accordance with the Defect Classification Table.

### Defect Classification Table For Film Color

Defect	Classification
Film color not as specified	Critical

## Film Stability

### Definitions

A measure of the ability of photographic film images to resist change in density under specified storage conditions.

**LE-10 Film.** A photographic film that is suitable for the preservation of records for a minimum of 10 years when stored under medium term storage conditions.

**LE-100 Film.** A photographic film that is suitable for the preservation of records for a minimum of 100 years when stored under extended term storage conditions.

### Sources

ANSI/ASC PH 4.8, PH1.43, ANSI IT9.1 and ANSI IT9.5.

### Instruments

Reference the standards listed under Sources.

### Procedure

- For Silver-Gelatin reference the methods described in IT9.1 and for Diazo IT9.5.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Film Stability

Defect	Classification
Noncompliance for specified LE rating	Critical

*NOTE 1.* This attribute applies only to LE-10 and LE-100 storage copies-not user distribution copies.

*NOTE 2.* Reference ANSI PH1.43 storage requirements for medium term (LE-10 film) and extended term (LE-100 or greater film).

*NOTE 3.* Medium term film is now LE-10 film and extended term film is now LE-100 film.

*NOTE 4.* Archival and long term storage are now defined as extended term storage.

*NOTE 5.* Thiosulfate ion concentrations must not be greater than 0.014 grams per square meter.

## Flatness

### Definitions

Microfiche or microfilm that maintains a continuous horizontal surface.

**Sources** ANSI/ASC PH1.29.

### Instruments

- Comparator with a scale graduated in increments of 0.1 mm or 0.005 inch.
- Hygrometer or comparable humidity gauge.
- Celsius thermometer with 1 degree Celsius divisions capable of reading temperatures in the 23 degree Celsius range.

### Procedure

- Place a randomly selected microfiche or a 148.00 mm (5.83 inch) length of microfilm concave side upward on a flat surface for a minimum of 6 hours in an environment of 23 degrees Celsius (plus or minus 2 degrees) and 50 percent relative humidity (plus or minus 5 percent).
- Measure the curl at its greatest point above the flat surface.
- Measure microfilm curl, only in the transverse direction, at its greatest point above the flat surface.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Flatness

Defect	Classification
Microfiche curl greater than 6.35 mm (0.25 inch)	Major

Microfilm curl for 16 mm greater than 1.00 mm (0.04 inch)r	Major
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Microfilm curl for 35 mm greater than 2.10 mm (0.08 inch)	Major
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## Format

### Definitions

The number of rows of images, columns or apertures of a microform.

**Sources** ANSI/AIIM MS5, MS14, and ANSI Z39.32.

**Instruments** None.

### Procedure

- Visually count the number of rows, columns or apertures.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Format

Defect	Classification
Format not as specified	Critical

## Grid Alignment

### Definitions

The placement of a grid in relation to the edges of a microfiche.

**Sources** ANSI/AIIM MS5.

### Instruments

Optical comparator with a scale graduated in increments of 0.1 mm or 0.005 inch.

### Procedure

- Measure the distance between the left edge of the microfiche and the left edges of the upper left and lower left frames of the microfiche.
- Measure the distance between the bottom edge of the microfiche and the bottom edges of the lower left and lower right frames of the microfiche.
- Compute the difference between the two measurements made from the left edge of the microfiche and the difference between the two measurements made from the bottom edge of the microfiche. Whichever number is greater is the grid skewness.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Grid Alignment

Defect	Classification
Grid skewness greater than 1.0 mm	Major
Grid skewness greater than 1.0 mm deviation from supplied microfiche	Major

## Grid Placement

### Definitions

The placement of frames on a microform in conformance with AIIM or user defined formats.

**Sources** ANSI/AIIM MS5.

### Instruments

- Approved AIIM 98-frame grid gauge, X302 (1:24 reduction).
- Approved AIIM 270-frame grid gauge, X108 (1:48 reduction).
- User defined grids.

### Procedure

- Place the microfiche on top of the appropriate grid gauge, aligning the lower left reference corners.
- Observe if any microimages are outside the grid gauge boundary lines.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Grid Alignment

Defect	Classification
Any microimages outside the grid lines	Major

## Heading Area Backing

### Definitions

A colored stripe applied to the heading area and the degree to which it covers the heading area. The difference between the thickness of the heading area and the grid area.

**Sources** ANSI/AIIM MS5.

### Instruments

A gauge with a 0.0025 mm or 0.0001 inch measuring capability.

### Procedure

- Inspect to determine if there is any information in the heading area that is not completely covered by the heading backing.

- Examine the top row of the grid area to see if any part of the heading backing infringes on the grid area.
- Visually inspect the heading area for color of stripe.
- Inspect for thickness of backing.
  - Use the gauge to measure at least two places of the heading area and of the grid area.
  - Compute the average of these measurements.
  - Subtract the average thickness of the grid area from the average thickness of the heading area. The result is the heading area backing thickness.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Heading Area Backing

Defect	Classification
Color not as specified	Major
Information in the heading area not completely covered by the heading backing	Major
Heading area backing infringes on grid area with no loss of information	Major
Heading area backing thickness greater than 0.01 mm (0.0004 inch)	Major
Heading area backing infringes on grid area with loss of information	Critical

*NOTE 1.* The original should not have a backing.

*NOTE 2.* Silvers may occasionally have a 1mm stripe at the top edge to facilitate filing when specified in a contract.

## Image Mark

### Definitions

An optical mark, usually rectangular, within the recording area and located in the image mark channel, below and/or above the image area on a roll of microfilm. Used in image mark retrieval systems for automatically counting or locating image frames.

*NOTE.* Formerly known as a document mark or blip mark.

**Sources** ANSI/AIIM MS8.

**Instruments** Microform reader with an automatic retrieval function.

### Procedure

- Load roll of microfilm into the reader.
- Execute the automatic retrieval function for at least three randomly selected film frames.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Image Mark

Defect	Classification
Failure to automatically retrieve any film frame	Critical

## Image Placement

### Definitions

Placement of images on a microform.

**Sources** ANSI/AIIM MS-5.

**Instruments** Microform reader.

### Procedure

- Place the microform in the reader and view it at a magnification of 100 percent of the effective reduction.
- Glide the microform through the reader.
- Stop at a specific frame, all frames, or the required number of randomly selected frames as determined by MIL-STD-105.
- Compare the selected frames against the original source document for, but not limited to, pagination (horizontal or vertical), index and target placement, right reading, upside down images, and large document handling.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Image Placement

Defect	Classification
Any nonspecified image placement	Critical

## Image Squareness

### Definitions

Image squareness is either parallel or perpendicular to the top edge or bottom edge of the microform.

**Sources** ANSI/AIIM MS5.

### Instruments

- Approved AIIM 98-frame grid gauge, X302 (1:24 reduction).
- Approved AIIM 270-frame grid gauge, X108 (1:48 reduction).
- Optical comparator with a protractor reticule with 1 degree divisions.

### Procedure

- Place the appropriate grid gauge over the microfiche with either the left or bottom edge of the microfiche being aligned with the appropriate line on the gauge.
- Glide the microfiche along either the horizontal or vertical axis of the gauge so that the corner of the frame selected is aligned with a corner on the grid gauge.
- Stop at a specific frame, all frames, or the required number of randomly selected frames as determined by MIL-STD-105.
- Measure the skew angle formed by the grid boundary line and the edge of the frame.
- Measure the angle of skew formed between the baseline of the protractor (which is parallel to the edge of the film) and the edge of the frame.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Image Squareness

Defect	Classification
The number of frames that have a skew angle greater than 10 degrees that equal or exceed the reject criteria of MIL-STD-105 or exceed the AQL times the number of frames on the microfiche	Major

## Information

### Definitions

A specified item such as, but not limited to, characters, special characters, symbols, words, or images in the header or image areas.

**Sources** None.

**Instruments** Microform reader.

### Procedure

- Place the microform in the reader and view it at a magnification of 100 percent of the effective reduction.
- Glide the microform through the reader.
- Stop at a specific frame, all frames, or the required number of frames as determined by MIL-STD-105.
- Compare the selected frames against the furnished material.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Information

Defect	Classification
Wrong or nonspecified information	Critical
Loss of information	Critical

*NOTE 1.* Information may include, but is not limited to: specified items, characters, special characters, symbols, words, or images in the information areas.

## Jacket

### Definitions

A flat transparent plastic carrier with various sizes of single or multiple film channels made to hold single or multiple microfilm images. The channels are designed to permit insertion of processed photographic strips of cut roll microfilm.

**Sources** AIIM TR-11 and ANSI/AIIM MS11.

### Instruments

- Ruler with a scale graduated in increments of 0.1 mm or 0.005 inch.
- Optical comparator with a scale graduated in increments of 0.1 mm or 0.005 inch.

### Procedure

- Visually inspect the jacket for, but not limited to: number of channels, insertion openings, locating holes, stripe color, notches, and physical damage.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Jacket

Defect	Classification
Jacket size not as specified	Critical
Format not as specified	Critical
Number of channels not as specified	Critical
Channel width not as specified	Critical
Insertion openings not as specified	Critical
Locating holes not as specified	Critical
Parallelism not as specified	Critical
Squareness not as specified	Critical
Identification cut not as specified	Critical
Notch or notches not as specified	Critical
Color stripe missing	Critical
Any physical damage to a master jacket	Critical
Any physical damage to a duplicate jacket	Major
Color stripe not as specified	Major

## Leader and Trailer Length

### Definitions

**Leader.** A length of film at the beginning of a microfilm roll used for protection and for threading into equipment such as cameras, processors, and readers.

**Trailer.** A length of film following the last frame on a roll of microfilm.

**Sources** ANSI/AIIM MS14.

### Instruments

Ruler with a scale graduated in increments of 0.1 mm or 0.005 inch.

### Procedure

- Measure the leader and trailer portions of the microfilm.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Leader and Trailer Length

Defect	Classification
Deviates from specified leader or trailer length by minus 20 percent	Major

*NOTE 1.* Unless otherwise specified the minimum leader/trailer length for 35 mm film is 500 mm (19.7 inch) and for 16 mm film it is 700 mm (27.6 inch).

## Length and Width

### Definitions

**Length.** The direction of the film parallel to its forward movement in the film manufacturing equipment.

**Width.** The direction of the film at right angles to the forward movement in the film manufacturing equipment.

**Sources** ANSI PH1.51 and ANSI/AIIM MS14.

### Instruments

Optical comparator with a scale graduated in increments of 0.1 mm or 0.005 inch.

### Procedure

- Measure the length of the microfiche from the top and bottom corners and the width from the left and right corners at least 1 day after processing. Measure the width dimension only for roll microfilm.
- Use the measurement that gives the greatest difference in assessing a defect classification.

## Microfiche Length

Defect	Classification
Less than 147.25 mm (5.797 inch)	Major
Greater than 148.00 mm (5.827 inch)	Major

## Microfiche Width

Defect	Classification
Less than 104.25 mm (4.104 inch)	Critical
Greater than 105.00 mm (4.134 inch)	Critical

## Roll Microfilm, 16 mm Width

Defect	Classification
Less than 15.92 mm (0.627 inch)	Critical
Greater than 15.98 mm (0.629 inch)	Critical

## Roll Microfilm, 35 mm Width

Defect	Classification
Less than 34.95 mm (1.376 inch)	Critical
Greater than 35.00 mm (1.378 inch)	Critical

## Margins

### Definitions

**Microfiche.** The space between the left side and bottom and the equivalent edges of the grid area. See Figure 1.

**Roll Microfilm.** The area between the edge of the information area and the edge of the roll microfilm. See Figure 2.

**Sources** ANSI/AIIM MS5, MS8, and MS14.

### Instruments

- Approved AIIM 98-frame grid gauge, X302 (1:24 reduction).
- Approved AIIM 270-frame grid gauge, X108 (1:48 reduction).
- Optical comparator with a scale graduated in increments of 0.1 mm or 0.005 inch.

### Procedure

#### Microfiche

- Place the microfiche on top of the appropriate grid gauge, aligning the lower left reference corners.
- **Left Margin.** Use the comparator to measure the distance from the lower left corner of the grid area to the left edge of the microfiche and the distance from the upper left corner of the grid area to the left edge of the microfiche.
- **Bottom Margin.** Measure the distance from the lower left corner of the grid area to the bottom edge of the microfiche and the distance from the lower right corner of the grid area to the bottom edge of the microfiche.

- Compare each of the four measurements with the values given in the Defect Classification Table.
- Use the value with the largest variance to assess the defect classification.

#### Roll Microfilm

- Measure the A, B, and C dimensions as shown in Figure 2 for 16 mm and 35 mm roll microfilm.
- Assess a defect in accordance with the Defect Classification Table.

#### Microfiche Produced From Furnished Microfiche

- Place the duplicate microfiche on top of the furnished microfiche, aligning their lower left reference corners.
- Measure any up and down or left and right image deviations.
- Use the greater deviation in assessing the defect classification. Do not measure the bottom margin when the bottom row of the microfiche does not contain microimages.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Margins

### Microfiche

Defect	Classification
Less than 3.5 mm (0.138 inch)	Major
Greater than 4.5 mm (0.177 inch)	Major
Deviations greater than 0.5 mm from the margins of furnished microfiche	Major

### Roll Microfilm, 16 mm, Unperforated

Defect	Classification
"A" dimension less than 0.510 mm (0.020 inch)	Major
"B" dimension less than 0.510 mm (0.020 inch)	Major
"C" dimension greater than 14.900 mm (0.587 inch)	Major

### Roll Microfilm, 16 mm, Perforated-One Edge\*

\* For film perforated on one edge, dimension "A" applies to the perforated edge.

Defect	Classification
"A" dimension less than 2.790 mm (0.110 inch)	Major
"B" dimension less than 0.510 mm (0.020 inch)	Major
"C" dimension greater than 12.620 mm (0.497 inch)	Major

## Roll Microfilm, 16 mm, Perforated-Two Edges

Defect	Classification
“A” dimension less than 2.790 mm (0.110 inch)	Major
“B” dimension less than 2.790 mm (0.110 inch)	Major
“C” dimension greater than 10.340 mm (0.407 inch)	Major

## Roll Microfilm, 35 mm, Unperforated

Defect	Classification
“A” dimension less than 0.970 mm (0.038 inch)	Major
“B” dimension less than 0.970 mm (0.038 inch)	Major
“C” dimension greater than 33.020 mm (1.300 inch)	Major

## Roll Microfilm, 35 mm, Perforated-Two Edges

Defect	Classification
“A” dimension less than 5.480 mm (0.216 inch)	Major
“B” dimension less than 5.480 mm (0.216 inch)	Major
“C” dimension greater than 24.000 mm (0.944 inch)	Major

## Microfiche Set

### Definition

A specific collection of microfiche satisfying contractual requirements.

**Sources** None.

**Instruments** None.

### Procedure

- Visually inspect the set for completeness and proper collation.
- Assess a defect in accordance with the Defect Classification Table.

### Defect Classification Table for Microfiche Set

Defect	Classification
Improper collation	Major
Set contains one or more additional or duplicate microfiche	Major
Set missing one or more microfiche	Critical

## Microform Usability

### Definitions

A microform capable of being used for its intended purpose.

**Sources** ANSI/AIIM MS23 and MS43.

**Instruments** Microform reader.

### Procedure

- Microforms Produced From Source Material.
  - Place the microform in the reader and view it at a magnification of 100 percent of the effective reduction.
  - Glide the microform through the reader.
  - Stop at a specific frame, all frames, or the required number of randomly selected frames as determined by MIL-STD-105.
  - Visually inspect for any physical or photographic defects. Defects are not limited to those included in MS23 or MS43, for example, staples or staple holes.
- Microforms Produced From Supplied Microforms.
  - Inspect for any physical or photographic defects that were not present in the supplied microform.
- For Class A Film.
  - Place the microform in the reader and view it at a magnification of 100 percent of the effective reduction.
  - Stop at a specific frame, all frames, or the required number of randomly selected frames as determined by MIL-STD-105.
  - Produce a blowback of each selected frame or frames.
- Assess a defect in accordance with the Defect Classification Table.

### Defect Classification Table for Microform Usability

Defect	Classification
Any photographic defect to a nonsilver microform in the information areas	Major
Any photographic defect to a silver master microform	Critical
Any physical damage to a microform	Critical
Microform or blowback unreadable	Critical

*NOTE 1.* If physical or photographic defects on a microform obliterate information, GPO will refer to the Quality Attribute for Information.

## Packaging

### Definitions

The materials and methods used for protection and identification of microforms during handling, filing, display, shipment and storage. The materials must contain no adhesive or chemical that might produce a degenerative effect upon the film or enclosure-envelopes, cartridges, packages, etc. They must also be free from particulate matter and have a pH value of no less than 7.0.

**Sources** ANSI IT9.2

**Instruments** None.

### Procedure

- Inspect all packing materials and procedures to insure compliance with contractual requirements.
- Assess a defect in accordance with the Defect Classification Table.

### Defect Classification Table for Packaging

Defect	Classification
Noncompliance with contractual requirements	Critical

## Reduction Ratio

### Definitions

The quotient of a linear dimension of an object and the corresponding linear dimension of the image of the same object expressed, for example, as 1:24 or 1:48.

**Sources** ANSI/AIIM MS23.

### Instruments

Optical comparator with a scale graduated in increments of 0.1 mm or 0.005 inch.

### Procedure

- Measure the length of the scale on the film image of the test target.
- Divide this measurement into the confirmed length of the original scale. The value obtained is the actual reduction of the microimage.
- If there is no scale present, obtain the reduction by measuring the image of an object whose full size dimensions are known. For example, if it is known that the width of a page which was microfilmed is 8.5 inch and the width of the microimage of the page on the microfiche is 0.355 inch then the reduction may be obtained by dividing 0.355 inch into 8.5 inch giving a value of 24, thus a reduction of 1:24.

- Divide an equivalent full-size page dimension by its corresponding frame dimension to determine the effective reduction for computer output microfilm.
- Assess a defect in accordance with the Defect Classification Table.

### Defect Classification Table for Reduction Ratio

Defect	Classification
For 1:24. Values less than 1:24 or greater than 1:25	Major
For 1:42. Values less than 1:42 or greater than 1:44	Major
For 1:48. Values less than 1:48 or greater than 1:50	Major

For other reduction ratios less than the reduction ratio specified or greater than 1.04 times the specified reduction ratio Major

*NOTE 1.* If the contract permits, small source documents could be filmed at a reduction less than specified to fill the frame.

## Resolving Power

### Definitions

Numeric expression of the ability of an optical or photographic system to distinguish or separate two entities spaced closely together. In micrographics, it is the product of the number of the pattern resolved in the ISO Test Chart No. 2 multiplied by the reduction and is expressed in line pairs per millimeter.

**Test Chart.** Consists of an arrangement of test patterns of increasing spatial frequency expressed in line pairs per millimeter containing patterns numbered from 1.0 to 18.

**Test Pattern.** Made up of two sets of five parallel line rectangular groups that are perpendicular to each other.

**Resolved Pattern.** A pattern is resolved when the two groups of lines constituting this pattern can be visually distinguished in both directions.

### Sources

ANSI/AIIM MS1, MS17, MS23 and MS28; and ANSI/ISO 3334.

### Instruments

Microscope with a magnification between 0.5 and 1.0 times the anticipated resolving power of the system expressed in line pairs per millimeter.

## Procedure

- View the test chart at the appropriate magnification.
- Determine from the test chart the pattern number associated with the smallest test pattern that can be resolved.
- Use the test chart with the lowest pattern number to determine the defect classification if a frame contains more than one test chart.
- Assess a defect in accordance with the Defect Classification Table.

**Example.** — A contract specified the 6.3 pattern to be resolvable for the first generation microform. The test target is composed of five ISO Test Charts No. 2. The center test chart resolved the 5.0 pattern while the other four test charts resolved the 6.3 pattern. The 5.0 pattern is used in determining the defect classification.

## Defect Classification Table for Reduction Ratio

Defect	Classification
A deviation of more than one test pattern below that of the specified pattern to be resolved	Major
For one generation from the supplied master microform a deviation of more than one test pattern below the master's resolved pattern	Major
For two generations from the supplied master microform a deviation of more than two test patterns below the master's resolved pattern	Major
For three generations from the supplied master microform a deviation of more than three test patterns below the master's resolved pattern	Major

*NOTE 1.* The form slide, as described in MS1 and MS28, does not give any indication of the resolution of the character generator for alphanumeric COM. However, it does help in obtaining information concerning overall photographic system quality such as the optical system of the COM recorder, duplicator, or processor.

*NOTE 2.* Graphic COM is addressed in ANSI/AIIM MS39.

## Safety Film

### Definitions

Film that meets flammability specifications defined by ANSI standards.

**Sources** ANSI/ASC PH1.25 and ANSI IT9.1.

### Instruments

Reference the standards listed under Sources.

## Procedure

- Reference the methods described in the standards listed under Sources.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Safety Film

Defect	Classification
Noncompliance with referenced standards	Critical

## Splicing

### Definitions

The joining of two ends of film into a continuous piece.

**Sources** ANSI/AIIM MS18.

### Instruments

- Optical comparator with a scale graduated in increments of 0.1 mm or 0.005 inch.
- Optical comparator with a protractor reticule with 1 degree divisions.
- A thickness gauge with a 0.0025 mm (0.0001 inch) measuring capability.

### Procedure

- Measure the width of the gap and the alignment of the edge.
- Use the comparator to determine if there is any angular misalignment between the two joined ends.
- Use the thickness gauge to obtain at least three readings along the splice and preceding the splice.
- Compute the average thickness value and subtract the appropriate number of film thicknesses from this average and record this difference as the splice thickness build-up.
- Assess a defect in accordance with the Defect Classification Table.

## Defect Classification Table for Splicing

Defect	Classification
Number of splices greater than specified	Major
Gap width greater than 1.0 mm (0.040 inch)	Major
Edge alignment greater than 0.05 mm (0.002 inch)	Major
Angular misalignment greater than 1 degree	Major
Splice thickness buildup greater than 0.15 mm (0.006 inch)	Major

NOTE 1. Ultrasonic splicing is recommended for polyester base film with an LE-100 rating or greater.

## Thickness

### Definitions

The distance between the planes formed by the front and back surfaces of a microform.

Sources ANSI/AIIM MS5 and ANSI PH1.51.

### Instruments

A thickness gauge with a 0.0025 mm (0.0001 inch) measuring capability.

### Procedure

- Use the gauge to obtain at least four readings at different places on the microform.
- Compute the average value and record this as the thickness.
- Assess a defect in accordance with the Defect Classification Table.

### Defect Classification Table for Thickness

Defect	Classification
Thickness less than specified or 0.025 mm (0.001 inch) greater than specified	Major

NOTE 1. The thickness of all microfiche shall be 0.10 mm to 0.23 mm (0.004 inch to 0.009 inch) for polyester base films.

Figure 1. – Margins for Microfiche

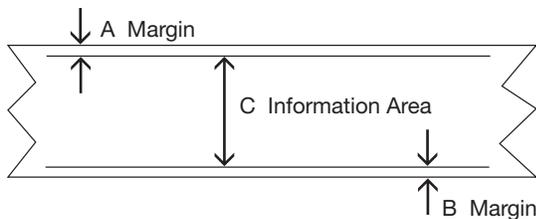
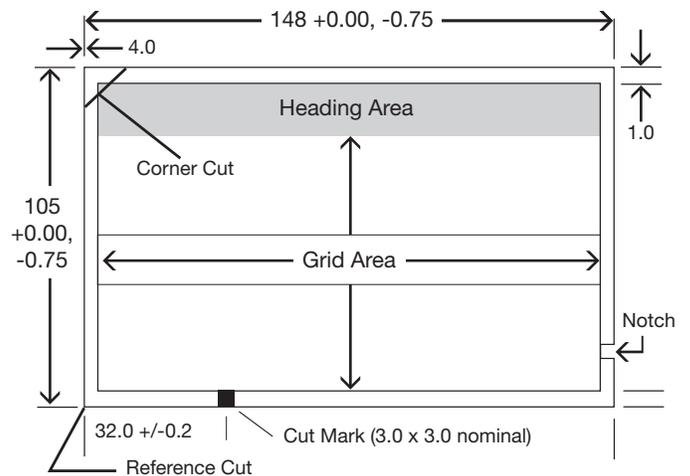


Figure 2. – Margins for Roll Microfilm



Note: The Corner Cut and Notch represent even generations.

All dimensions are given in millimeters.