

INTERNATIONAL STANDARD

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Micrographics — Microfilming of documents on 16 mm and 35 mm silver-gelatin type microfilm — Operating procedures

iTeh STANDARD PREVIEW

*Micrographie — Micrographie des documents sur films argentiques de
16 mm et 35 mm — Techniques opératoires*

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Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 6199 was prepared by Technical Committee ISO/TC 171, *Micrographics and optical memories for document and image recording, storage and use*.

Annexes A, B, C, D and E of this International Standard are for information only.

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Introduction

This International Standard establishes procedures for producing microfilm with standard characteristics of presentation and quality from a diversity of documents.

Compliance with these requirements will enable an operator to provide legible microfilm.

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Micrographics — Microfilming of documents on 16 mm and 35 mm silver-gelatin type microfilm — Operating procedures

1 Scope

This International Standard establishes general principles for document filming on 16 mm and 35 mm silver-gelatin type microfilm, including orientation of images on film, area for codes, and the information required to facilitate identification, classification, testing and subsequent use of the microfilm.

It applies to rotary and planetary filming.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 446:1991, *Micrographics — ISO character and ISO test chart No. 1 — Description and use.*

ISO 543:1990, *Photography — Photographic films — Specifications for safety film.*

ISO 554:1976, *Standard atmospheres for conditioning and/or testing — Specifications.*

ISO 3272-1:1983, *Microfilming of technical drawings and other drawing office documents — Part 1: Operating procedures.*

ISO 3334:1989, *Micrographics — ISO resolution test chart No. 2 — Description and use.*

ISO 4330:1987, *Photography — Determination of the curl of photographic film.*

ISO 4331:1986, *Photography — Processed photographic black-and-white film for archival records — Silver-gelatin type on cellulose ester base — Specifications.*

ISO 4332:1986, *Photography — Processed photographic black-and-white film for archival records — Silver-gelatin type on poly(ethylene terephthalate) base — Specifications.*

ISO 5466:1986, *Photography — Processed safety photographic film — Storage practices.*

ISO 6196-1:1980, *Micrographics — Vocabulary — Section 01: General terms.*

ISO 6196-2:1982, *Micrographics — Vocabulary — Section 02: Image positions and methods of recording.*

ISO 6196-3:1983, *Micrographics — Vocabulary — Part 03: Film processing.*

ISO 6196-4:1987, *Micrographics — Vocabulary — Part 04: Materials and packaging.*

ISO 6196-5:1987, *Micrographics — Vocabulary — Part 05: Quality of images, legibility, inspection.*

ISO 6196-6:—¹⁾, *Micrographics — Vocabulary — Part 06: Equipment.*

ISO 6200:1990, *Micrographics — First generation silver-gelatin microforms of source documents — Density specifications.*

ISO 9878:1990, *Micrographics — Graphical symbols for use in microfilming.*

1) To be published.

ISO 10196:1990, *Micrographics — Recommendations for the creation of original documents.*

ISO/TR 10200:1990, *Legal admissibility of microforms.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 6196 apply.

4 Preparation of documents

The document file should be examined carefully for, among others, condition of documents, legibility, order, targets, and foreign objects.

Appropriate action should then be taken prior to microfilming (see annex A).

5 Conditions of microfilming

5.1 Rawstock microfilm

The microfilm shall comply with the requirements of ISO 543, ISO 4330, ISO 4331, and ISO 4332.

5.2 Formats and orientation

5.2.1 Formats

The formats commonly used in roll microfilm are shown in figure 1.

The dimensions for the placement of the documents on the film are listed in table 1.

Table 1 — Dimensions for indicated areas for un-perforated film without document marks (see figure 1)

Dimensions in millimetres

Dimension	16 mm film	35 mm film
A min.	0,50	0,97
B min.	0,50	0,97
C max.	14,92	33,00
D min. ¹⁾	0,50	0,97

1) For all formats except simplex.

5.2.2 Orientation

Images should be recorded preferably in the horizontal mode (orientations 1B and 2B of simplex format of figure 1). If this arrangement is not possible, the images shall be placed in any of the other orientations shown in figure 1.

The preferred orientation of images for filming in the duo, duplex, or combination duo duplex formats, is also shown in figure 1.

5.2.3 Roll-film coding

Documents recorded on rolls of microfilm should be indexed in such a way that individual documents or series of documents can be easily located. Examples of index systems are shown in annex B.

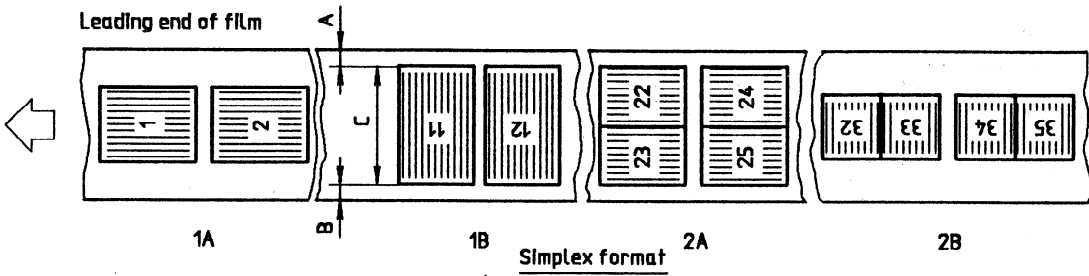
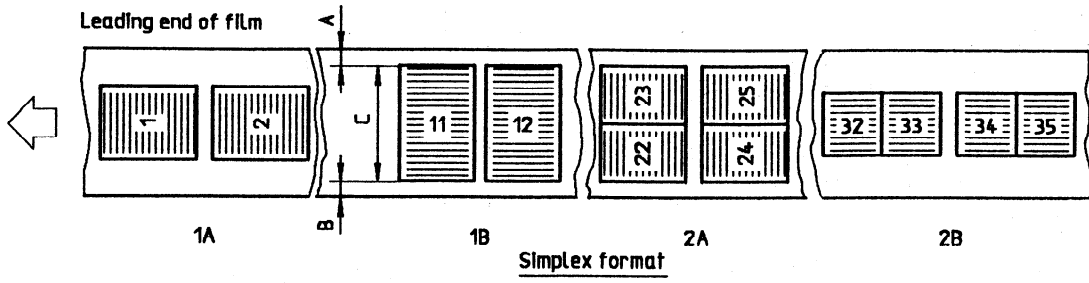
5.3 Reduction ratio

The reduction ratio shall be determined by the size of the characters, the quality of the originals (see ISO 10196), the quality of the camera/film system, and the size of the documents to be microfilmed. The orientation of the document on the film and the film size should then be determined, in relation to the reduction ratio that will accommodate the document and the desired quality. The film format and reduction ratio selected should allow the smallest alphanumeric characters to be legible in a distribution copy projected on a reader screen and in a hard-copy made from a distribution copy.

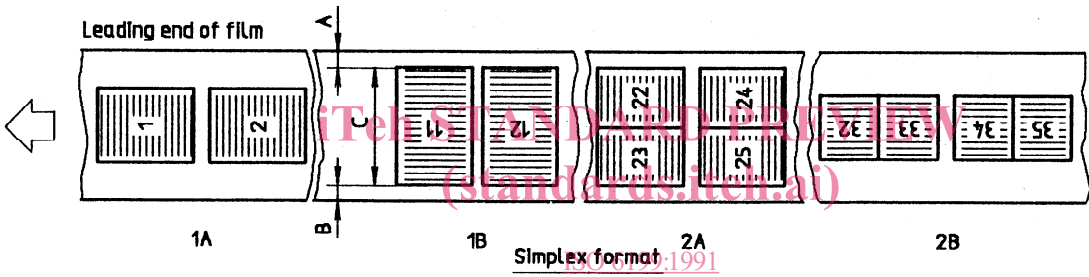
Annex C provides procedural information to determine the level of image quality for a given micrographic system.

5.4 Maximum dimensions of the document

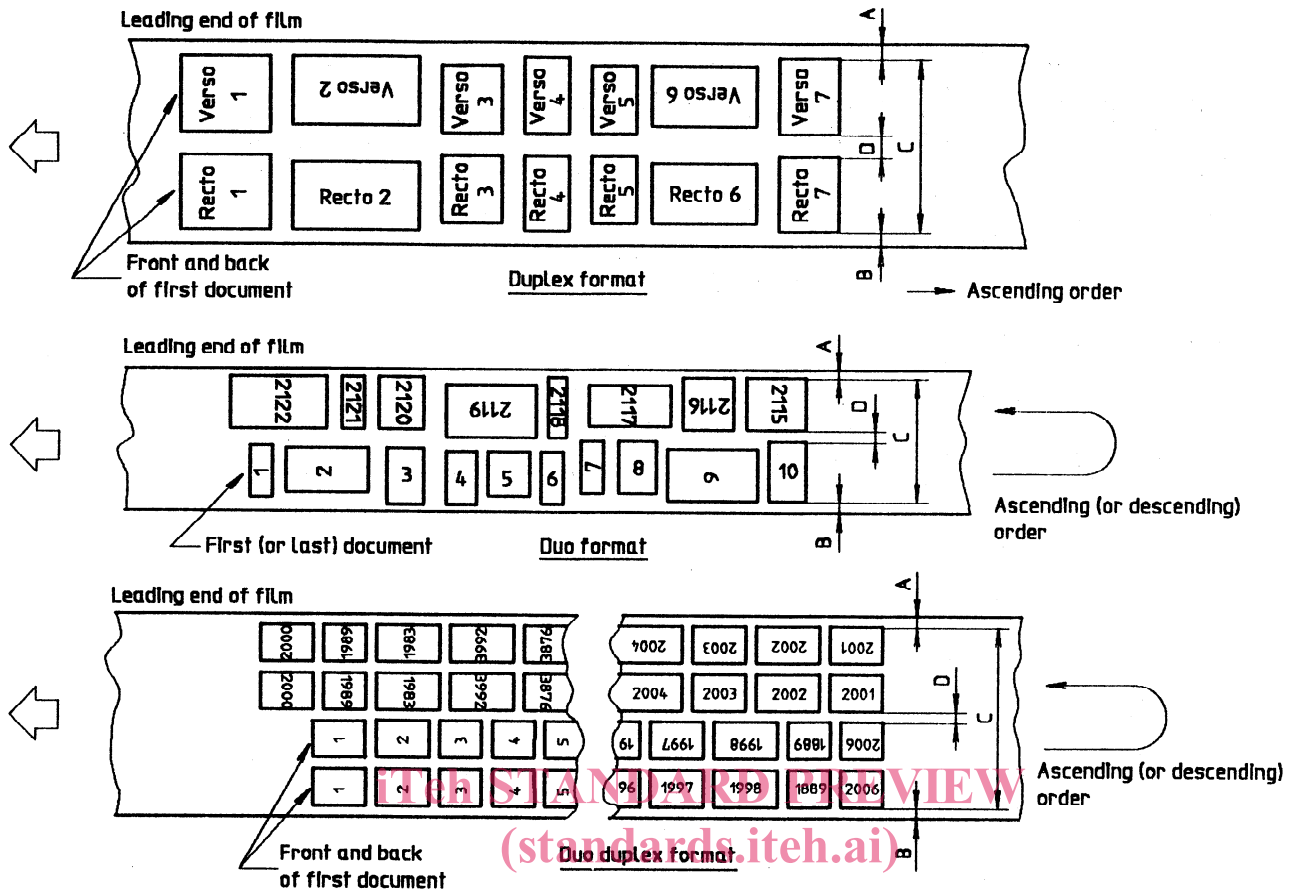
The maximum height or width of a document that can be recorded on the usable width of the film as indicated in table 1 and figure 1 for uncoded film, and figure 2 for coded film, depends on the film format, the reduction ratio and the type of camera to be used, either rotary or planetary.



Alternative orientation for documents with right to left scripts



Preferred orientation for documents with horizontal and right to left scripts



NOTES

- 1 On the duplex format, the image orientation of one row (front) is controlled by the orientation of the text on the original page, and the image orientation of the opposite row (back) is controlled by the image orientation of the above-mentioned row.
- 2 The duo duplex format is used primarily in banking applications.

Figure 1 — Roll microfilm formats

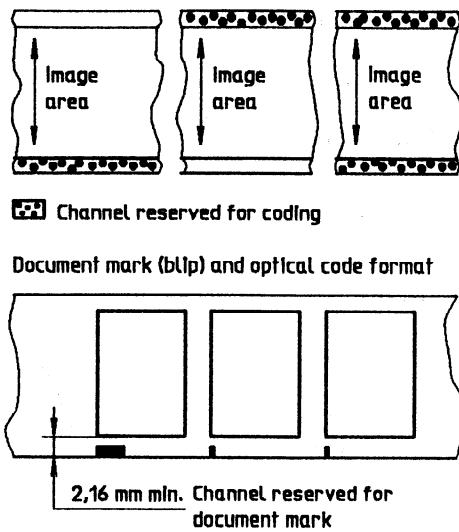


Figure 2 — Channels provided for document marks (blips) and optical code format

5.4.1 Simplex format in rotary cameras

The side of the document parallel to the length of the film may be any length. Table 2 lists two of the most commonly used reduction ratios for the simplex format of uncoded film in 16 mm rotary cameras. If the document is close to the recordable size, a higher reduction ratio should be used to avoid the possi-

bility of image loss caused by the skewing of the document while being photographed.

NOTE 1 The size of the document is limited by the width of the throat of any document feeder.

Table 2 — 16 mm rotary microfilm camera — Simplex format for uncoded film

Dimensions in millimetres

Nominal reduction ratio	Maximum dimension of document side perpendicular to the long axis of the film
1:20	298
1:24	357

5.4.2 Simplex format in planetary cameras

The simplex format is also used with general use planetary cameras which can have variable reductions and a variable film advance. Consequently, the aperture in the camera has a maximum length and width. Table 3 lists the maximum dimensions of documents for different reduction ratios. For fixed advance cameras, see table 4. For technical drawing applications, see ISO 3272-1. The actual dimensions of the documents should be less than that indicated to allow for positioning errors.

NOTE 2 When placing a 35 mm film strip consisting of three frames in an A6 jacket, the maximum film advance should be 47,5 mm.

Table 3 — Planetary roll film camera with adjustable film advance

Dimensions in millimetres

Nominal reduction ratio	Approximate maximum field size (subject to 3 % variation)			
	16 mm unperforated film camera aperture size		35 mm unperforated film camera aperture size	
	length	width	length	width
1:6	229	90	267	190
1:8	305	120	356	254
1:10	381	150	444	318
1:12	457	180	533	381
1:14	533	210	622	444
1:15	572	225	667	476
1:16	610	240	711	508
1:18	686	270	800	572
1:20	762	300	889	635
1:21	800	315	933	667
1:22	838	330	978	698
1:24	914	360	1 067	762
1:26	991	390	1 156	826
1:27	1 029	405	1 200	857
1:28	1 067	420	1 245	889
1:29	1 105	435	1 289	921
1:30	1 143	450	1 334	952
1:32	1 219	480	1 422	1 016
1:34	1 295	510	1 511	1 080
1:36	1 372	540	1 600	1 143

ISO 5.4.3.9 Simplex format coding

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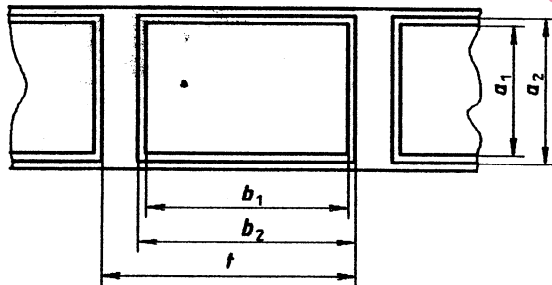


Figure 3 — Image frame ($a_2 \times b_2$), image area ($a_1 \times b_1$) and frame pitch (t)

The simplex format is also used with film that is coded along the edge with a document mark or a photo-optical code. Coded film is produced in both planetary and rotary cameras at a fixed reduction ratio. The manufacturer of the camera will provide the maximum dimensions for documents filmed in the camera. The actual dimensions of the documents should be less than that indicated to allow for positioning errors.

5.4.4 Duplex and duo formats in rotary cameras

Table 4 — Planetary roll film camera with fixed film advance (see figure 3)

Dimensions in millimetres

35 mm microfilm	Dimensions
Image frame ($a_2 \times b_2$)	$32_{-0,5}^0 \times 45_{-0,5}^0$
Image area ($a_1 \times b_1$)	30,4 × 41,0 (max.)
Frame pitch (t)	$52_{-1,2}^0$

The duplex and duo formats are used only in rotary cameras.

Table 5 lists the maximum dimensions of the document for a few of the most commonly used reduction ratios for the duplex and duo formats. The dimensions should be less than the maximum to allow for errors in positioning and transporting the documents.

Table 5 — 16 mm rotary microfilm camera duplex and duo formats for uncoded film

Dimensions in millimetres

Nominal reduction ratio	Maximum height or width of documents
1:32	230
1:40	288
1:45	324
1:50	360

5.4.5 Images in the duo duplex format

The images in the duo duplex format should be arranged in one of the preferred orientations shown in figure 1. For dimensions, see table 1.

6 Filming procedures**6.1 Documents recorded on more than one roll of film**

If multiple rolls are required to film a complete sequence of documents, the order and continuity shall

be maintained. The last image on each roll shall indicate the identification of the next roll by a target "Continued on roll number ..." and the first image on each of the following rolls shall be a target "Continued from roll number ...". The last roll shall conclude with an "END" target.

6.2 Leader and trailer

In addition to any fogged film, which can be removed, each roll of exposed 35 mm microfilm shall have at the beginning and end (500^{+200}_0) mm of unexposed film.

To accommodate automatic threading readers for 16 mm film, at least 700 mm shall be left at the beginning and end of each roll.

7 Filming sequence

If needed, the following items should be included in the microfilm in the order indicated in figure 4.

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