INTERNATIONAL STANDARD

ISO 10196

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Micrographics — Recommendations for the creation of original documents

Micrographie — Recommandations pour la création des documents originaux

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 10196 was prepared by Technical Committee ISO/TC 171, *Micrographics and optical memories for document and image recording, storage and use*.

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

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Introduction

The expanding use of modern means for managing, conserving, safeguarding and exchanging documents requires the creation of original documents of high quality. At the time of preparation it is not always known whether a document will be microfilmed or scanned. The requirements of this International Standard should be taken into account in the preparation of any document to ensure that the document is of a quality that will reproduce well in case it has to be microfilmed or scanned.

These recommendations should be part of the directives concerning usual management of companies, in particular as concerns the creation and duplication of documents.

The quality of the original document has a direct effect upon the quality of the microimage. Recording operations carried out on microforms, therefore, greatly depend on certain characteristics of the original document which are essential for the production of high quality microforms.

The progress made in the field of micrographics leads to the use of increasingly greater reduction ratios, which correspondingly makes the creation of originals more important.

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Micrographics — Recommendations for the creation of original documents

1 Scope

This International Standard provides guidance on the creation of original documents to facilitate their reproduction as microforms.

It applies to documents in black on a clear background, made up of continuous lines. Although studies were based more specifically on the Latin alphabet, the general principles can be used as guidelines for the production of documents using other alphabets or ideograms.

It does not apply to technical drawings for which requirements are given in ISO 5457 and ISO 6428.

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 5-3:1984, *Photography — Density measurements — Part 3: Spectral conditions.*

ISO 5-4:1983, *Photography — Density measurements — Part 4: Geometric conditions for reflection density.*

ISO 216:1975, *Writing paper and certain classes of printed matter — Trimmed sizes — A and B series.*

ISO 2470:1977, *Paper and board — Measurement of diffuse blue reflectance factor (ISO brightness).*

ISO 5457:1980, *Technical drawings — Sizes and layout of drawing sheets.*

ISO 5627:1984, *Paper and board — Determination of smoothness (Bekk method).*

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 6428:1982, *Technical drawings — Requirements for microcopying.*

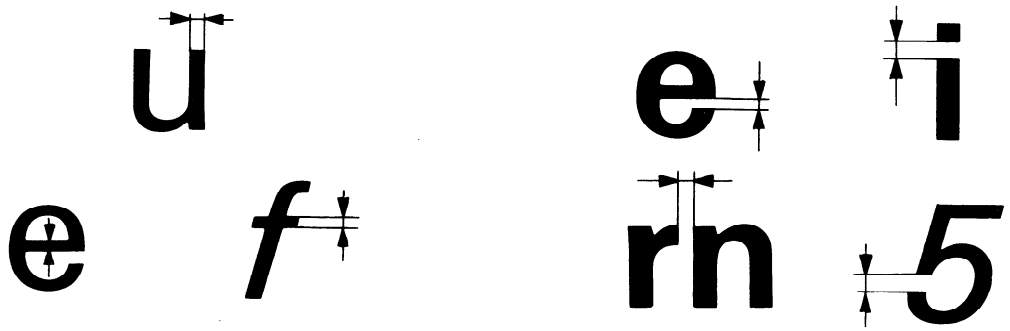
3 Definitions

For the purposes of this International Standard, the terms and definitions contained in ISO 6196 apply. The following definitions also apply:

3.1 basic detail (d): Smallest element, whether black or white, necessary for the recognition of an individual character (see figure 1).

Example: width of the stroke (in particular of the upstroke), space within a symbol, separation between symbols.

1) To be published.



Black detail White detail

Figure 1 — Examples of a basic detail

3.2 document: A combination of a medium and the information recorded on or in it.

NOTE 1 In this International Standard, "document" means eye-legible typescript, hand-writing, printing and illustrations.

3.3 character font: Set of printing characters of the same style, weight and size (in sufficient quantity to enable typographic composition).

NOTE 2 A font is characterized by its type face family and size, e.g. Univers 55, sizes 2,13 mm.

3.4 optical class (symbol C): Number, representative of the geometrical design of a type of character, used for calculating its legibility and reproducibility limits.

3.5 object-image ratio (symbol r): Relationship between the dimensions of the object and the corresponding dimensions of the image either of the source document (object) and the microimage or of the microimage (object) to its image on the screen or on the paper.

4 Physical characteristics of the paper (or other materials)

4.1 Sizes

The documents should be presented on paper of trimmed sizes defined in ISO 216.

4.2 Quality of paper

Paper with a base weight greater than 60 g/m^2 should be used. Papers with heavy base weights (over 150 g/m^2) can be unsuitable for rotary cameras and document self-feeding systems.

The opacity of paper should be sufficient to minimize show-through. A method for evaluating opacity is given in annex A .

The paper should have a minimum smoothness of 15, measured according to the Bekk method described in ISO 5627. Otherwise, the edge of the lines and characters would become uneven.

Avoid the use of paper incorporating fluorescent agents.

4.3 Colour

A white base should be used, with a reflectance factor of at least 75 %, measured in accordance with ISO 2470.

If this is not the case, the differences in the background visual diffuse reflection density, either on the same page or between pages, should not exceed 0,10, measured in accordance with ISO 5-3 and ISO 5-4.

4.4 Translucent base

When a translucent base is used, its visual diffuse reflection density should be less than 0,25 measured in accordance with ISO 5-3 and ISO 5-4.

5 Printing characteristics

5.1 Choice of a character font

Annex A and annex B give guidance on the choice of a character font. The following recommendations should be taken into account.

5.1.1 Legibility

Character sets should be easily recognizable. Character fonts with ornate, condensed or narrow characters, or letters and numerals similar in form should be avoided (see figure 2).

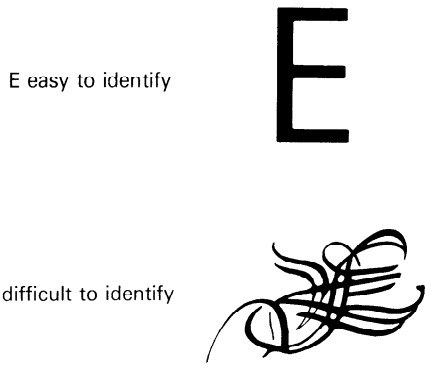


Figure 2 — Examples of letter E

5.1.2 Character size

Character sets of which the minimum height of the lower-case "e" is 1,8 mm should be used. The use of smaller characters can cause problems in reproduction.

The ratio of heights between upper and lower-case characters should be 3 to 2.

The width to height ratio of the lower-case "e" should be between 0,9 and 1,1.

The line width of characters should be at least 0,18 mm, preferably 0,25 mm or more.

The line width to height ratio of the lower-case "e" should be less than 0,20.

Figure 3 shows how to measure the characters.

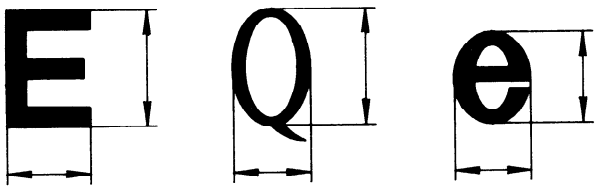


Figure 3 — Examples of character measurement

5.2 Spacing of lines of text

The space between two base lines of characters should be at least equal to 1,5 times height of the upper-case letter, measured as shown in figure 4.

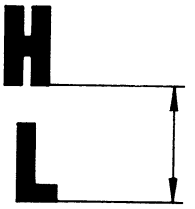


Figure 4 — Measurement of line spacing

5.3 Contrast

The contrast in visual reflection density between the text and the background should be constant and as great as possible.

5.4 Print quality

In order to obtain high quality printing, high-gloss inks and techniques that impair the flatness of the paper surface, e.g. embossing or imprinting should be avoided.

Ink choice should minimize penetration, diffusion and smudging. The adhesion to the paper shall be good.

6 Presentation of the text

6.1 Arrangement

Pages should, if possible, be in the same format.

6.2 Margins

Adequate margins should be allowed, normally 25 mm on the binding edge and 10 mm on the other edges.

Annex A
(informative)

Method for evaluating the opacity of paper

The original document should be produced on paper that is opaque enough to ensure reproduction of good quality.

In practice, the problem is to determine whether a given paper can be used for printing on both sides.

A simple method of checking is to place two sheets of the paper to be used over a sheet of paper with a dense black image on it, e.g. dry transfer letter, printed area. If the dense black image is not visible through two sheets, the paper is acceptable.

Annex B
(informative)

Optical class of characters

B.1 General

When creating an original document suitable for microfilming, the choice of the type of characters to be used is of particular importance. In most instances, this choice is based on aesthetic considerations, but it is essential that the type or size of the characters chosen will produce legible micro-images.

The optical class of characters is a concept formulated in order to enable the creator of the document to make a careful choice.

B.2 Method

Each character font has one value of optical class, (symbol C), calculated using the following equation:

$$C = \frac{H}{d}$$

where

H is the height of upper-case characters of the font;[2)]

d is the basic detail.

B.3 Application to micrographics

The optical class allows the comparison of the size of the basic detail of the document, (symbol d), to the resolution limit (inverse of resolving power) of the system, (symbol δ), in relation to the object-image ratio, (symbol r).

The result obtained permits the user

— either to determine the minimum size (H min.) of the character set to be used with a given reduction ratio, using the following equation:

$$H \text{ min.} = \delta \times r \times C$$

— or to determine the maximum scale (r max.) to be used with a given character set, using the following equation:

$$r \text{ max.} = \frac{H}{C \times \delta}$$

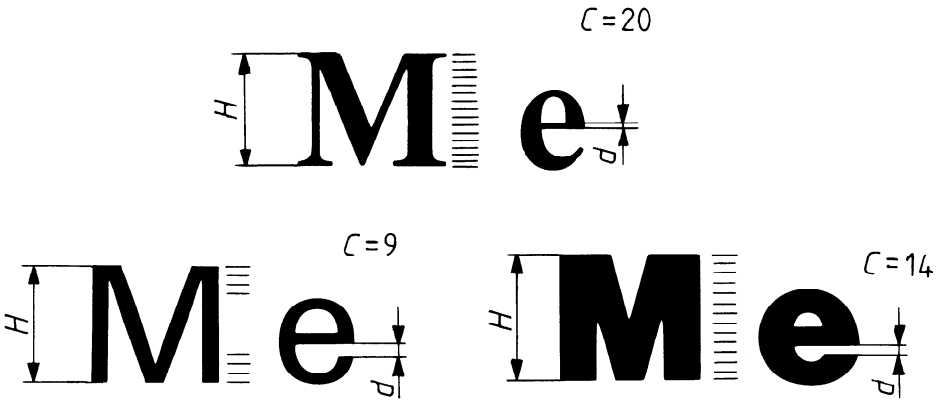


Figure B.1 — Examples of optical classes

2) The height of the upper-case of a font is the vertical distance between the base line and the top of the letters (without stems or details) (see figure 3).