INTERNATIONAL STANDARD

ISO 3334

Second edition
1989-11-15

Micrographics — ISO resolution test chart No. 2 — Description and use

Micrographie — Mire de résolution ISO n° 2 — Description et utilisation

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Reference number
ISO 3334 : 1989 (E)

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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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International Standard ISO 3334 was prepared by Technical Committee ISO/TC 171, *Micrographics and optical memories for document and image recording, storage and use.*

This second edition cancels and replaces the first edition (ISO 3334 : 1976), of which it constitutes a minor revision.

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Introduction

Micrographic systems vary in their ability to record fine detail such as alphanumeric characters or closely spaced lines. The method specified in this International Standard involves the measurement of the ability of a given objective, photosensitive material and processing combination to reproduce the image of fine detail and therefore can be applied to define and control this aspect of imaging quality.

Since microrecording systems can be operated close to limits of legibility, resolution testing provides a safeguard against the loss of information, although other factors also contribute to the overall quality of the micro-image.

ISO 3334 describes a method of testing resolution that employs the ISO resolution test chart No. 2, in which the test patterns and their arrangement are shown in figures 1 and 2.

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Micrographics — ISO resolution test chart No. 2 — Description and use

1 Scope

This International Standard specifies a method of determining resolution by measuring the minimum size of detail recognizable in a processed microform. It describes the test patterns and ISO resolution test chart No. 2, and gives the method of expressing resolving power. ISO resolution test chart No. 2 is designed for use as part of a test target, as required in other International Standards for micrographics.

This International Standard applies to the determination of the resolving power of a camera, film and processing combination used in a microfilming system or the resolution achieved in microforms therefrom. In this form it does not apply to the determination of the resolving power of microform readers, reader-printers or computer output microform (COM) imaging systems.

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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 3: 1973, *Preferred numbers — Series of preferred numbers.*

ISO 5-1 : 1984, *Photography — Density measurements — Part 1: Terms, symbols and notations.*

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 2471 : 1977, *Paper and board — Determination of opacity (paper backing) — Diffuse reflectance 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.*

3 Definitions

For the purpose of this International Standard, the terms and definitions contained in ISO 6196 apply.

4 Description of the test chart

4.1 Base

The test chart shall be made on either an opaque or a transparent base.

4.1.1 Opaque base

The test chart shall be made on a white opaque base with a glossy surface. Its visual diffuse reflection density, measured as specified in ISO 5-3 and ISO 5-4, shall be not more than 0,08. The opacity, measured as specified in ISO 2471, shall be over 85 %. This test chart is positive-appearing.

1) To be published.

4.1.2 Transparent base

The test chart shall be made on a non-coloured transparent base having a maximum visual diffuse transmission density, base + fog, of 0,08, measured as specified in ISO 5-2 and ISO 5-3. This test chart can be positive-appearing or negative-appearing.

4.2 Test pattern

The test pattern shall consist of a numbered group of two sets of five parallel lines at right angles as shown in figure 1. The lines and spaces between them shall be of equal width. The visual reflection density of the lines shall be not less than 1,60 and of the spaces not more than 0,02 when measured relative to the white of the paper on which the chart is printed. A suggested level of quality for the appearance of the lines and space is discussed in annex A.

For a test chart on a film base, the minimum density difference between the base and the characters shall be 3,0.

To measure the widths of lines and spaces for conformance to values given in table 1, a precision microscope equipped with a micrometer, an optical comparator, or a computer-controlled co-ordinate measuring machine shall be used. These instruments shall be calibrated and capable of measuring to 1 µm or smaller.

4.3 Spatial frequency of test patterns

The dimensions of the range of test patterns used in the test chart shall be as specified in table 1, in which the sequence of steps, starting at 1.0, is in accordance with the R 20 series of preferred numbers given in ISO 3, with a first rounding except for the 1.25 and 12.5 patterns. Rounding of these numbers would have varied the spatial frequency sequence by too large a percentage. This gives an average increment of 12,2 % per step. The sequence thus obtained is shown in table 1. Measurement for the tolerances shown shall be made after the test chart has been maintained at a temperature of 23 °C ± 2 °C and a relative humidity of 50 % ± 5 % for a period of at least 1 h.

4.4 Method of numbering test patterns

The number that designates a test pattern shall be its spatial frequency expressed in line pairs per millimetre. For example, in the pattern designated 2.0, each line is 0,25 mm wide so that a line pair of one line and one space is 0,5 mm wide, therefore the pattern's spatial frequency is 2 line pairs/mm.

4.5 Test pattern number

The number of each test pattern shall be placed within the top right-hand quarter of the rectangle formed by the pattern. The size of the number shall be as shown in figure 1. The typeface used shall be "futura" medium or other sans serif typeface suitable for photographic reproduction.

4.6 Arrangement of test patterns

The test patterns shall be arranged on the test chart in order of increasing spatial frequency as shown in figure 2.

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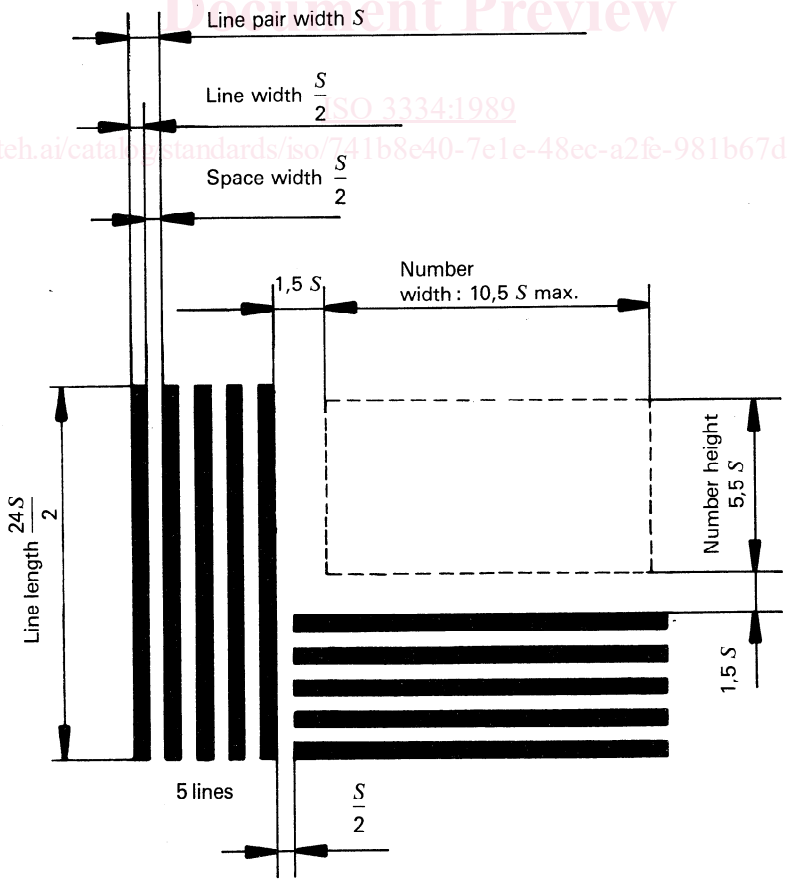

Figure 1 — Resolution test pattern