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Micrographics — Quality control of COM recorders that generate images using a single internal display system —

Part 1:
Characteristics of the software test target

Micrographie — Contrôle de la qualité des microformes produites sur un système électronique (COM) de génération d'image adressage de points —

Partie 1: Caractéristiques de la cible contrôle de la qualité

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Foreword

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The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this part of ISO 14648 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14648-1 was prepared by Technical Committee ISO/TC 171, *Document imaging applications*, Subcommittee SC 1, *Quality*.

ISO 14648 consists of the following parts, under the general title *Micrographics — Quality control of COM recorders that generate images using a single internal display system*:

— *Part 1: Characteristics of the software test target*

— *Part 2: Method of use*

Introduction

This part of ISO 14648 provides a specification for characteristics of a software test target used for the image quality evaluation of Computer Output Microfilm (COM) recorder systems that generate images using a single internal display system.

Micrographics — Quality control of COM recorders that generate images using a single internal display system —

Part 1:
Characteristics of the software test target

1   Scope

This part of ISO 14648 specifies the characteristics of a software test target that is electronically generated, to be used in COM recorder systems that can accept electronic forms. The components have been designed to check or test certain capabilities of the COM recorder system in order to enable image quality to be assessed and maintained. The recording method (i.e. laser scanner, cathode ray tube, light emitting diode, etc.) is not relevant in establishing the software test target components.

2   Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 14648. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 14648 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

ISO 5-3:1995, *Photography — Density measurements — Part 3: Spectral conditions*

ISO 6196-1:1993, *Micrographics — Vocabulary — Part 1: General terms*

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

ISO 6196-6:1992, *Micrographics — Vocabulary — Part 6: Equipment*

ISO 6196-7:1992, *Micrographics — Vocabulary — Part 7: Computer micrographics*

3   Terms and definitions

For the purposes of this part of ISO 14648, the terms and definitions given in ISO 6196 and the following apply.

3.1
dot
smallest unit that can be recorded on microfilm by the COM recorder system

4 Test targets

4.1 General

Two test targets are specified. Target 1 (see Figure 2) is intended for COM systems that have limited bit map memory. The complexity and number of components on the test target are limited to a few basic types.

For COM systems having greater bit map memory capability, Target 2 (see Figure 3) has more components with increased complexity.

4.2 Dot spacing

The centre to centre spacing of consecutive dots is related to the resolution specification of the original full document size being recorded at the reduced microfilm size. For example, if the original is specified at a resolution of 240 dpi then the dot spacing at full size is 0,004 2 inches. If this is reduced to microfilm at a reduction of 48× then the pixel spacing on film is 0,000 087 inches. As depicted in Figure 1, the dot overlap ratio is equal to the diameter/centre to centre spacing. The dot diameter is typically larger than the centre to centre spacing so that the recording of consecutive dots is smoothed to form a line. The ratio of dot diameter to dot spacing is generally a factor chosen between 1,3 and 1,5 by the COM recorder system manufacturer. Thus, the dot diameter varies with the reduction and also with the resolution.

4.3 Grid layout

The grid shall consist of 132 cells horizontally and 64 cells vertically forming columns and rows in which characters may be placed. The outside dimensions of the grid conform to the text dimensions 335,3 mm in the horizontal direction and 270,9 mm in the vertical direction at full size.
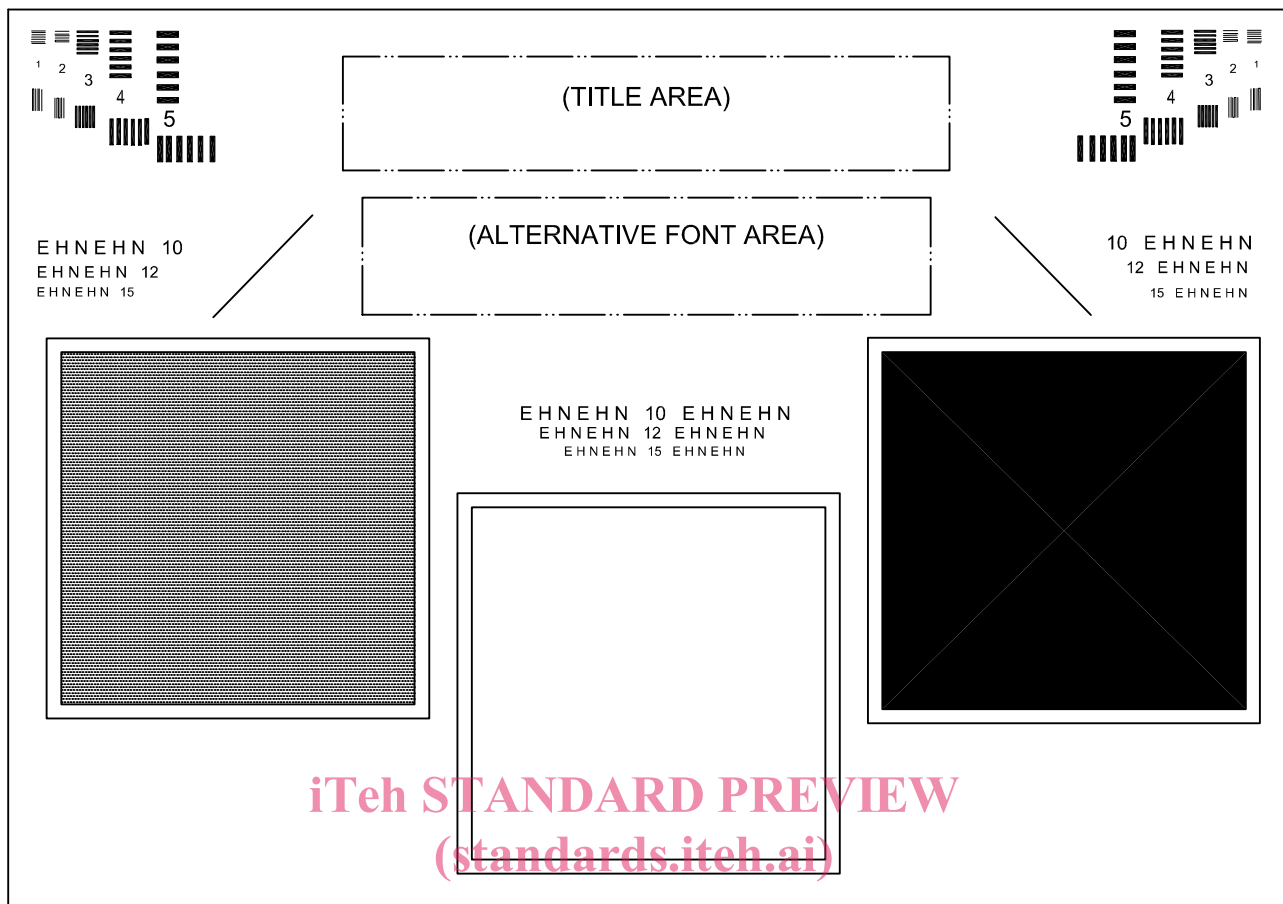
4.4 Border

A line of single dot width shall enclose the grid patterns of Target 1 and Target 2, see Figures 2 and 3, spaced from the grid pattern by one cell size. The size of the border in terms of the grid pattern is 134 columns by 66 rows. It shall be generated at the extreme edge of the cells specified in 4.3.
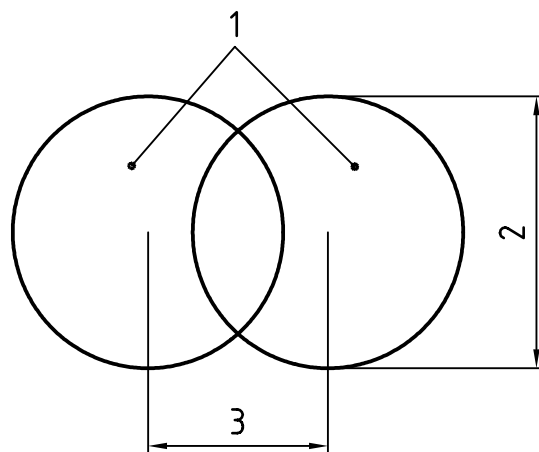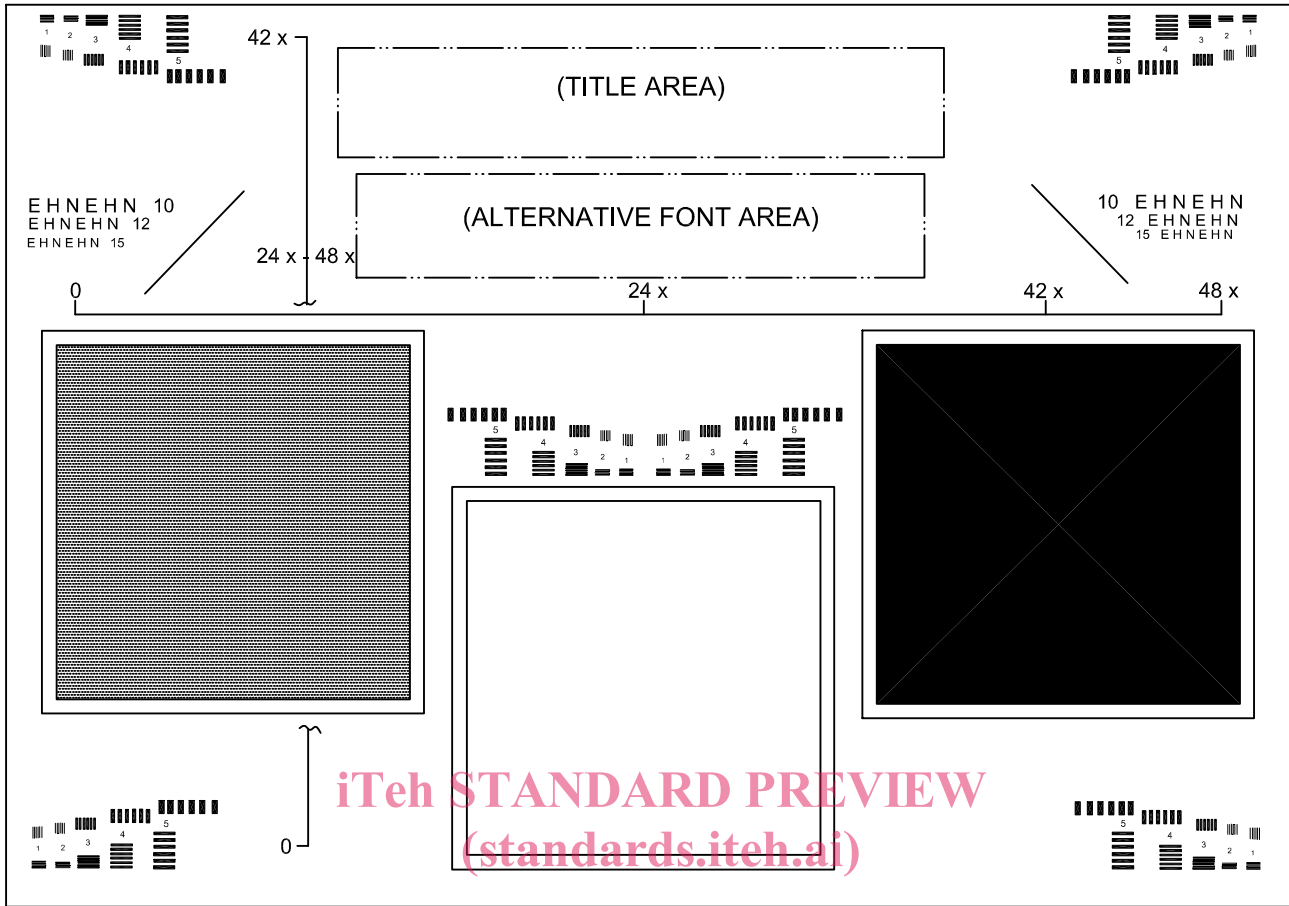

Key

1 Dots

2 Diameter

3 Centre to centre

Figure 1 — Dot overlap

Figure 2 — Sample layout of Target 1

Figure 3 — Sample layout of Target 2

4.5   Test charts

A test chart shall comprise five test patterns. Each test pattern shall comprise two groups of six lines and five spaces of equal width, each group at right angles to the other, numbered one to five to indicate its line width in dots. Each line shall be 48 dots in length. Spaces between horizontal and vertical groups shall be 10 dots and 27 dots respectively.

Target 1 shall include two test charts located in the upper left and right corners of the target. Target 2 shall include six test charts, one in each corner and two near the centre of the target. The notional corner of the smallest pattern in each test chart shall be positioned as specified in Table 1.

NOTE   One or more patterns of a test chart may not be resolvable depending on the COM recorder system adjustment, accuracy of focus and degree of dot overlap (see Figure 1) designed into the system to smooth out consecutive dot recording to appear as a line. However, the smallest pattern that is resolvable by the human eye with the aid of a microscope can be used for future reference in detecting any changes in system performance.

Table 1 — Grid positions of test charts

Pattern	Column	Row
Top left	2	1
Top right	131	1
Centre left	64	36
Centre right	69	36
Bottom left	2	64
Bottom right	131	64

4.6 Density measuring areas

Three density patches, 40 columns wide by 24 rows high enclosed in a box having a two dot line width, shall be provided. There shall be a blank area one column wide between the sides of a box and its density patch and a similar area half a row high between the top and bottom of a box and its density patch.

The patch on the right side shall be generated as solid (all dots on), the patch in the centre shall be clear (all dots off) and the patch on the left shall be cross-hatched with lines one dot wide and spaces two dots wide. An inner border one dot wide, delineating the clear area of the centre patch, shall be produced.

The locations of the patches, referenced to the top left corners of the outer box, shall be as specified in Table 2.

Table 2 — Density area positions

Box type	Top left coordinate
Solid	Column 90, row 32
Cross-hatched	Column 2, row 32
Clear	Column 46, row 39

4.7 Diagonal lines

There shall be two lines, one dot width, located as in Table 3.

The lines shall run through the entire cell that is identified as an end point.

Table 3 — Diagonal line positions

Line	Top location	Bottom location
Left	Column 22, row 18	Column 8, row 26
Right	Column 111, row 18	Column 125, row 26

4.8 COM character legibility areas

The primary character pattern used for judging legibility shall comprise of upper case letters E, H and N, as generated by the COM recorder, having pitches of 0,394, 0,472 and 0,591 characters per millimetre. The areas shall be positioned as in Table 4, and Figures 2 and 3.