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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Tubular tips for hand-held technical pens using India ink on tracing paper —

Part 2: Performance, test parameters and test conditions

Pointes tubulaires pour plumes tubulaires et instruments de dessin à main à encre de Chine, utilisés sur papier calque —

Partie 2: Performances, paramètres d'essai et conditions d'essai

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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 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.

International Standard ISO 9175-2 was prepared by Technical Committee ISO/TC 10, *Technical drawings*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Tubular tips for hand-held technical pens using India ink on tracing paper —

Part 2: Performance, test parameters and test conditions

1 Scope and field of application

This part of ISO 9175 specifies the performance requirements for tubular tips used on tracing paper, the requirements of the India ink lines drawn using tubular tips, and the test parameters and test conditions to test compliance with these requirements.

The requirements of this part of ISO 9175 shall be fulfilled for tubular tips designated and marked in accordance with ISO 9175-1.

2 References

ISO 128, *Technical drawings — General principles of presentation*.

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

ISO 9175-1, *Tubular tips for hand-held technical pens using India ink on tracing paper — Part 1: Definitions, dimensions, designation and marking*.

ISO 9957-1, *Fluid draughting media — Part 1: Water-based black India ink for tracing paper — Requirements and test conditions*.¹⁾

ISO 9961, *Technical drawings — Draughting media — Natural tracing paper*.¹⁾

3 Definitions

The definitions given in ISO 9175-1 also apply to this part of ISO 9175.

4 Performance

To ensure consistency and accuracy in the preparation and reproduction of technical drawings, various line thicknesses and fixed relations between these line thicknesses are necessary.

The permissible deviations in the line thickness are given in the table. These deviations are used as a basis for the determination of the line quality.

Table — Permissible deviation in line thickness

Dimensions in millimetres

Line thickness ¹⁾ <i>d</i>	Permissible deviation
0,13 ²⁾	+ 0,03 − 0,01
0,18	+ 0,03 − 0,01
0,25	+ 0,03 − 0,01
0,35	+ 0,04 − 0,04
0,5	+ 0,05 − 0,05
0,7	+ 0,07 − 0,07
1	+ 0,1 − 0,1
1,4	+ 0,2 − 0,2
2	+ 0,2 − 0,2

1) According to ISO 128.

2) Not yet considered in ISO 128.

5 Test parameters and test conditions

5.1 Basic test concept

Test lines of India ink are drawn on natural tracing paper in accordance with 5.4. The line thicknesses are measured.

5.2 Climatic conditions for testing

The tests shall be carried out under standard test atmosphere 23/50 in accordance with ISO 554.

1) At present at the stage of draft.

5.3 Test equipment and accessories

5.3.1 Test machine

The test machine shall be an electromechanical line-draughting device with an adjustable writing angle, writing load, speed and line pitch.

5.3.2 Test paper

The test paper shall be natural tracing paper (see ISO 9961).

It shall be left to stabilize under the standard test atmosphere (see ISO 554) for a minimum of 24 h before the test is performed.

The test strip shall be cut parallel to the longest edge of the test paper.

5.3.3 Test fluid

The test lines shall be drawn using India ink (see ISO 9957-1).

The India ink shall be supplied to the tubular tip by means of a freshly refilled reservoir or a new ink cartridge.

5.4 Test lines

Prepare the tubular technical pen, of which the tubular tip is under test, according to the manufacturer's specifications for cleaning, filling and type of India ink (5.3.3).

Fit the tubular technical pen in the test machine (5.3.1) and draw 10 lines of approximately 5 m in total length in accordance with the following specifications.

The load on the tubular tip shall be 0,1 N for $d = 0,13$ mm and 0,2 N for $d > 0,18$ mm.

The writing angle of the tubular technical pen shall be 87° to the horizontal plane of the oncoming test paper, as shown in figure 1.

The draughting speed shall be

- a) $5 \pm 0,3$ cm/s for $d = 0,13$ to $0,7$ mm;
- b) $3 \pm 0,2$ cm/s for $d = 1$ and $1,4$ mm;
- c) $2 \pm 0,2$ cm/s for $d = 2$ mm.

The conveyor belt shall consist of a polyester film, 0,1 mm thick, moving on a solid smooth metal plate.

The step-transverse movement (pitch) of the test machine shall be 3 mm/cycle.

5.5 Measurement of line thickness

The line thickness shall be determined

- a) microscopically, using a micrometer scale in the ocular, or
- b) by using magnified projection on a projector microscope.

The measuring device shall have a minimum accuracy of 0,01 mm.

The line thickness measurements shall be taken at the 10 intersections of an imaginary line, drawn perpendicular to the test lines, with the 10 test lines.

A further set of measurements shall be made at a distance of approximately 150 mm from the first imaginary line. The irregularities at the edges of the test lines are interpolated visually (see figure 2) and the measurement is taken as the distance between these interpolated averages.

The test result is the arithmetic average of the 20 measurements, rounded off to the nearest 0,01 mm.

6 Test report

The test report shall contain the following information:

- a) reference to this part of ISO 9175;
- b) type and designation of the tubular technical pen under test;
- c) type and designation of the India ink used;
- d) test result (line thickness), in millimetres, as specified in 5.5;
- e) details of any deviations in test parameters or conditions from those specified in this part of ISO 9175;
- f) technical data, name of the test centre, date and signature of the inspector.

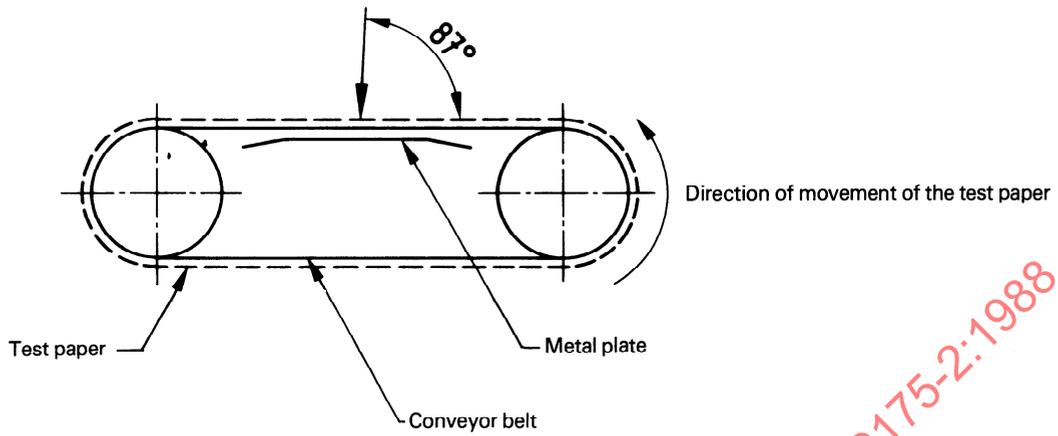


Figure 1 – Schematic representation of the test machine

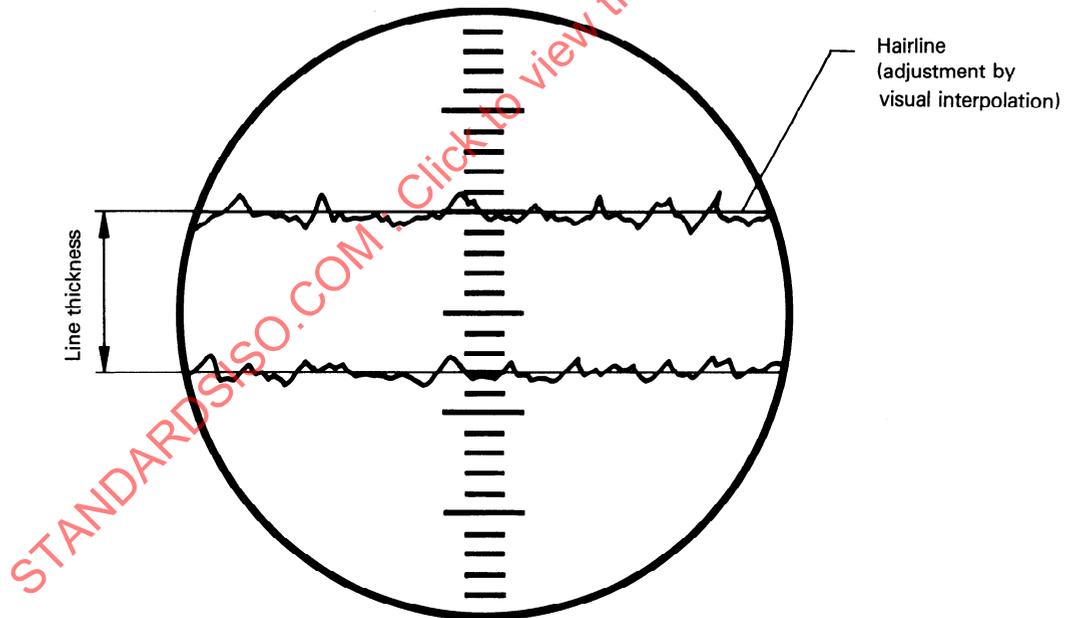


Figure 2 – Evaluation of the line thickness

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