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Fluid draughting media —

Part 1:

Water-based India ink — Requirements and test conditions

Sample Document

Fluides à dessin —

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ISO 9957-1:1992(E)

Foreword

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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 9957-1 was prepared by Technical Committee ISO/TC 10, *Technical drawings, product definition and related documentation*, Sub-Committee SC 9, *Media and equipment for drawing and related documentation*.

ISO 9957 consists of the following parts, under the general title *Fluid draughting media*:

- *Part 1: Water-based India ink for tracing paper — Requirements and test conditions*
- *Part 2: Water-based non-India ink for tracing paper — Requirements and test conditions*

Annex A of this part of ISO 9957 is for information only.

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Fluid draughting media —

Part 1:

Water-based India ink — Requirements and test conditions

1 Scope

This part of ISO 9957 specifies the requirements and test conditions for water-based India ink intended for use in drawing instruments conforming to ISO 9175-1 used on natural tracing paper conforming to ISO 9961, to provide black line technical drawings¹⁾.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9957. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9957 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 5-2:1991, *Photography — Density measurements — Part 2: Geometric conditions for transmission density*.

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

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

ISO 2240:1982, *Photography — Colour reversal camera films — Determination of ISO speed*.

ISO 9175-1:1988, *Tubular tips for hand-held technical pens using India ink on tracing paper — Part 1: Definitions, dimensions, designation and marking*.

ISO 9175-2:1988, *Tubular tips for hand-held technical pens using India ink on tracing paper — Part 2: Performance, test parameters and test conditions*.

ISO 9177-2:1989, *Mechanical pencils — Part 2: Black leads — Classification and dimensions*.

ISO 9961:1992, *Draughting media for technical drawings — Natural tracing paper*.

ISO 10209-1:1992, *Technical product documentation — Vocabulary — Part 1: Terms relating to technical drawings: general and types of drawings*.

3 Definitions

For the purposes of this part of ISO 9957, the definitions given in ISO 9175-1 and the following definition apply.

3.1 India ink; China ink: A water-based drawing fluid that contains dispersed carbon black as its primary colorant.

4 Requirements

Drawings made with India ink shall be reproducible using conventional reproduction techniques (blue-print, microfilming photography, electrostatics, etc.) assuming that reproduction and exposures consistent with the recommendations of the process and the supplier of the materials are used.

This part of ISO 9957 specifies the quality requirements of India ink lines as follows:

— line width (see 5.4.2);

1) Term defined in ISO 10209-1.

- optical density (see 5.4.3);
- drying time (see 5.4.4);
- adhesion (see 5.4.5);
- erasability (see 5.4.6);
- resistance to water (see 5.4.7);
- fade resistance (see 5.4.8).

India ink lines (and characters) are archival, so that original drawings¹⁾ are highly resistant to ageing factors such as oxygen, humidity, light and temperature.

“Archival” means that under agreed storage conditions of original drawings made with India ink conforming to this part of ISO 9957 on natural tracing paper conforming to ISO 9961, the working life of the drawn lines should be at least as long as that of the substrate.

The life expectancy of the India ink in its original container shall be at least two years at storage conditions recommended by the supplier, starting from the day of manufacture.

5 Test parameters, test conditions and performance

5.1 Basic test concept

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

5.2 Climatic conditions for testing

The tests shall be carried out under standard test atmosphere 23/50 (see ISO 554).

5.3 Test equipment and accessories

5.3.1 Test machine

The test machine shall be an electromechanical line-drawing device²⁾ permitting the adjustment of :

- angle,
- writing load,
- speed, and
- line pitch.

2) On request ISO/TC 10 Secretariat will provide a list of suppliers.

5.3.2 Test paper

The test paper shall be natural tracing paper conforming with 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 pen

The test lines shall be drawn with a new tubular technical pen conforming with ISO 9175-1.

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

5.3.4 Densitometer

The densitometer shall measure optically diffuse or doubly diffuse transmission density in accordance with ISO 5-2 and ISO 5-4.

5.3.5 Measuring microscope or profile projector, magnification min. $\times 8$.

5.3.6 Stopwatch

5.3.7 Ordinary adhesive tape

5.3.8 Mechanical pencil, with a black lead ISO 9177-2-P-0,5, of hardness degree HB, and lead eraser.

5.3.9 Filtered xenon lamp

5.4 Testing

5.4.1 Test lines

Prepare the tubular technical pen according to the manufacturer's requirements for cleaning, filling and type of India ink.

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 requirements.

The load on the tubular technical pen shall be 0,1 N for pens intended to produce a line width $d = 0,13$ mm and 0,2 N for pens intended to produce a line width $d \geq 0,18$ mm.

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

The drawing speed shall be

- a) $5 \text{ cm/s} \pm 0,3 \text{ cm/s}$ for pens intended to produce a line width $d = 0,13 \text{ mm}$ to $0,7 \text{ mm}$;
- b) $3 \text{ cm/s} \pm 0,2 \text{ cm/s}$ for pens intended to produce a line width $d = 1 \text{ mm}$ and $1,4 \text{ mm}$;
- c) $2 \text{ cm/s} \pm 0,2 \text{ cm/s}$ for pens intended to produce a line width $d = 2 \text{ mm}$.

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

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

5.4.2 Measurement of line width

The line width shall be determined

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

The measuring device shall have a minimum accuracy of $0,01 \text{ mm}$.

The line width measurements shall be taken at the 10 intersections of an imaginary line perpendicular to the 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 $0,01 \text{ mm}$.

The maximum permissible deviation in the line width shall be within those given in the table of ISO 9175-2:1988.

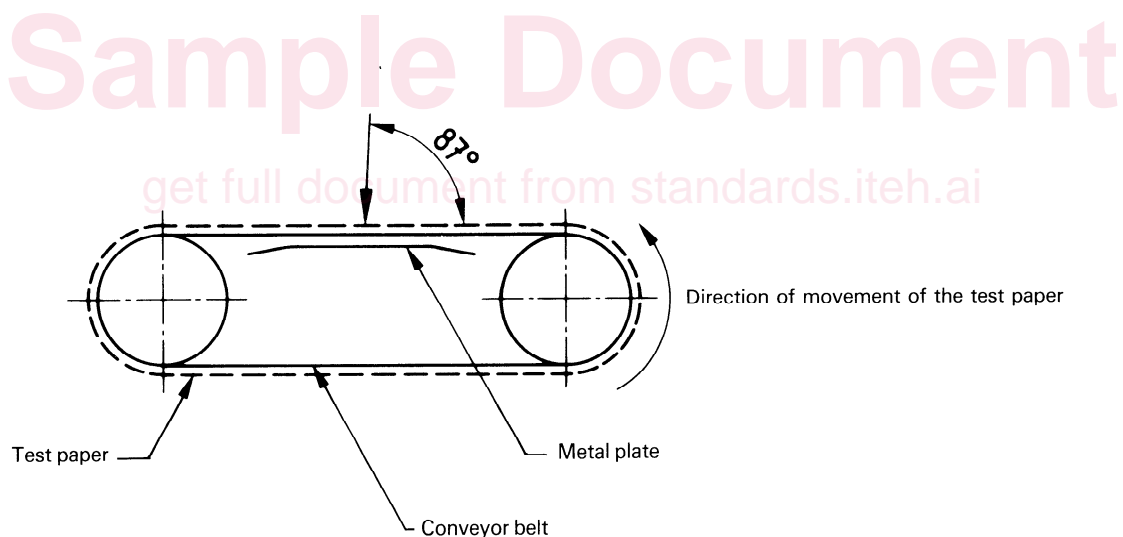


Figure 1 — Schematic representation of the test machine