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Fluid draughting media – Part 3: Water-based coloured draughting inks – Requirements and test conditions

The International Standard ISO 9957-3:1997 has the status of a Swedish Standard. This document contains the official English version of ISO 9957-3:1997.

Swedish Standards corresponding to documents referred to in this Standard are listed in "Catalogue of Swedish Standards", issued by SIS. The Catalogue lists, with reference number and year of Swedish approval, International and European Standards approved as Swedish Standards as well as other Swedish Standards.

Ritmateriel – Vätskebaserade ritmedia – Del 3: Vattenbaserade färgade tuscher – Krav och provning

Den internationella standarden ISO 9957-3:1997 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 9957-3:1997.

Motsvarigheten och aktualiteten i svensk standard till de publikationer som omnämns i denna standard framgår av "Katalog över svensk standard", som ges ut av SIS. I katalogen redovisas internationella och europeiska standarder som fastställts som svenska standarder och övriga gällande svenska standarder.

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ISO 9957-3:1997(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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9957-3 was prepared by Technical Committee ISO/TC 10, *Technical drawings, product definition and related documentation*, Subcommittee 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 — Requirements and test conditions*
- *Part 2: Water-based non-India ink — Requirements and test conditions*
- *Part 3: Water-based coloured draughting inks*

Annex A forms an integral part of this part of ISO 9957.

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Fluid draughting media —

Part 3:

Water-based coloured draughting inks — Requirements and test conditions

1 Scope

This part of ISO 9957 specifies the requirements and test conditions for water-based coloured draughting inks intended for use in tubular technical pens. The pen and ink combinations are intended primarily to provide for coloured lines and filled areas on natural tracing paper conforming to ISO 9961 and other draughting media.

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 listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 105-B02:1994, *Textiles — Tests for colour fastness — Part: Colour fastness to artificial light: Xenon arc fading lamp test.*

ISO 105-J03:1995, *Textiles — Test for colour fastness — Part J03: Calculation of colour differences.*

ISO 128-20:1996, *Technical drawings — General principles of presentation — Part 20: Basic conventions for lines.*

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

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 9957-1:1992, *Fluid draughting media — Part 1: Water-based India ink — Requirements and test conditions.*

ISO 9957-2:1995, *Fluid draughting media — Part 2: Water-based non-India ink — Requirements and test conditions.*

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

CIE Publication No. 15.2:1986, *Colorimetry.*

3 Definitions

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

3.1 coloured ink

non-black water-based low viscosity ink designed for writing or draughting, intended for the generation of coloured lines and filled areas

4 Classification

Coloured draughting inks shall be classified as one of the following types:

Type A: of relatively permanent character exhibiting adhesion, fade and water proofness and other properties conforming to ISO 9957-1;

Type B: of a less permanent character, exhibiting more fugitive colour characteristics and inferior formed film properties.

5 Requirements

Lines and filled areas made with coloured draughting inks may not necessarily be reproducible using conventional reproduction techniques, due to the spectral response of the imaging process, the spectral absorption and the reflectance characteristics of the individual coloured ink line.

The characteristics and requirements specified for lines drawn using the two types of coloured draughting inks are given in table 1 (yes = required, no = not required).

Table 1 — Characteristics and requirements specified for coloured draughting lines

Characteristic	Requirements specified	
	Type A	Type B
Line width (see 6.4.2)	yes	yes
Colour (see 6.4.3)	yes	yes
Drying time (see 6.4.4)	yes	yes
Adhesion (see 6.4.5)	yes	no
Erasability/redraughtability (see 6.4.6)	yes	no
Resistance to water (see 6.4.7)	yes	no
Fade resistance (see 6.4.8)	> 4 ¹⁾	no
1) Grey scale rating, in accordance with ISO 105-B02.		

Coloured ink lines and filled areas drawn with type A coloured draughting inks have limited fade resistance and permanence. Visual colour and contrast will not archive as well as India ink (see ISO 9957-1).

Coloured ink lines and filled areas drawn with type B coloured draughting inks

- are more fugitive and not as permanent as type A;
- are not as resistant as type A to ageing factors such as: oxygen, moisture, light and temperature;
- do not meet all the requirements of ISO 9957-1.

The graphical and mechanical characteristics of both types of coloured draughting inks shall be preservable in their original container for at least two years at the storage conditions recommended by the supplier starting from the day of manufacture which shall be written on a label attached to the container.

6 Test conditions, equipment and performance

6.1 Basic test concept

Test lines of the coloured draughting ink are drawn in accordance with 6.4 using a new tubular technical pen in accordance with ISO 9175-1, on natural tracing paper or any other paper recommended for the ink, and the lines are evaluated for the desired characteristic.

6.2 Climatic conditions for testing

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

6.3 Test equipment and accessories

6.3.1 Test machine

The test machine shall be an electromechanical line-draughting device¹⁾ permitting the adjustment of:

- writing angle;
- writing load;
- speed;
- line pitch.

See figure 1.

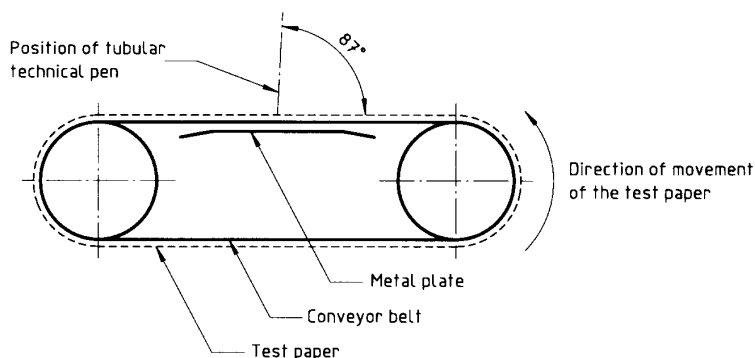


Figure 1 — Schematic representation of the test machine

6.3.2 Test paper

The test paper shall be natural tracing paper conforming to ISO 9961, or any other paper recommended for the ink. The paper shall be left to stabilize under the standard test atmosphere (see 6.2) 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.

¹⁾ On request, the ISO/TC 10 Secretariat will provide a list of suppliers.

6.3.3 Test pen

The test lines shall be drawn with a tubular technical pen in accordance with ISO 9175-1. The ink shall be supplied to the tubular tip by means of a freshly refilled reservoir or a new coloured-ink cartridge.

6.3.4 Reflectance colorimeter

The colorimeter shall measure colour in accordance with CIE Publication No. 15.2.

6.3.5 Measuring microscope or profile projector, magnification min. $\times 20$.

6.3.6 Stopwatch.

6.3.7 Adhesive tape.

6.3.8 Mechanical pencil, with a black lead ISO 9177-2-P-0,5 of hardness degree HB, and soft eraser for black lead (max. Shore A hardness 50).

6.3.9 Eraser, for use with India ink.

6.3.10 Filtered xenon lamp.

6.4 Testing

6.4.1 Test lines

Prepare the tubular technical pen (6.3.3) according to the manufacturer's specifications for cleaning, filling and type of coloured draughting ink.

Fit the tubular technical pen in the test machine (6.3.1) and draw 10 lines of approximately 5 m in total length in accordance with ISO 9175-2:1988 (5.4).

6.4.2 Line width

The line width shall be determined

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

The measuring device shall comply with the limits of permissible error of $\pm 0,01$ 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 10 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.

For limit deviations in the line width, see table 2.