DRAFT TANZANIA STANDARD

TBS /CDC 10 (5140) P_2–Ball Point Pen Ink – Specification (revision of TZS 71:1980)

TANZANIA BUREAU OF STANDARDS

Foreword

This Draft Tanzania Standard is being prepared by the Stationary and Paper Products Technical Committee, under the supervision of Chemicals Divisional Standards Committee and it is in accordance with the Procedures of the Bureau.

This Draft Tanzania Standard is first revision of TZS 71:1980 ''Ball Point Pen Ink – Specification''. This second edition cancels and replaces TZS 71:1980- Ball Point Pen Ink – Specification.

In reporting the results of a test analysis made in accordance with this finalized Tanzania Standard, if the final value, calculated or observed is to be rounded off, it shall be done in accordance with TZS 4 – Rounding off numerical values.

In the preparation of this draft Tanzania Standard assistance has been obtained from the following document:

IS 5805:2006 Specification for ink for ball pen refill published by Bureau of Indian Standards.

Draft Tanzania Standard TBS / CDC 10 (5140) P3

Ball point pen ink – Specification

1. Scope

This Draft Tanzania Standard specifies the requirements, methods of sampling and test for ball point pen ink used/for both direct filling or refilling cartridges of ball point pens.

2. Terms and definitions

For the purpose of this Draft Tanzania standard, the terms and definitions given in TZS 78 - Ink and allied industries - Glossary of terms shall apply (See Clause 2).

3. Requirements

3.1. General Requirements

3.1.1. Composition

The ink shall be solvent based. It shall contain no undissolved particles of dyestuffs/resins or agglomerates of undispersed pigments when examined under microscope of x 300 power.

3.1.2. Coverage

A quantity of 0.5 mL of the ink when filled directly or refilled in a ball point of 1.00 mm diameter shall write a line not less than 1500 m in length on bond paper.

3.2. Specific requirements

3.2.1. Smoothness and line continuity

When tested as prescribed in **Annex A**, the ink shall write smoothly and easily without drag and excessive pressure and with line continuity.

3.2.2. Starting characteristics

The ink shall satisfy the requirements of the test prescribed in **Annex B**.

3.2.3. Drying Time.

The ink shall dry within 5 seconds when tested as prescribed in **Annex C**.

3.2.4. Non-transferability

The ink shall not be legibly transferred when tested as prescribed in **Annex D**.

3.2.5 **Resistance to water**

The ink shall not be completely removed with water when tested as prescribed in **Annex E**.

3.2.6. Resistance to chemical bleach

The ink shall retain its legibility after two applications of chemical bleach when tested as prescribed in **Annex F**.

3.2.7. Resistance to light

The ink shall show no more than slight fading when tested as prescribed in **Annex G**.

3.2.8. Writing capability on Greasy surface

The ink shall be capable of writing legibly on greasy surface when tested with the method prescribed in **Annex H**.

3.2.9. Accelerated service test

The ink shall withstand the accelerated service test as described in **Annex J**.

3.2.10. Feathering and Penetration

The ink shall satisfy the test with the method prescribed in **Annex K**

3.2.11. pH Value

The ink shall have **pH** value between 6.0 to 6.5 when tested with the method prescribed in **Annex L**.

3.2.12. Surface Tension

The surface tension value of the ink shall be between 35 to 40 dynes /cm when tested with the method prescribed in **Annex M**.

4. Packaging and Marking

4.1 Packaging

The ink shall be packed in a suitable container.

4.2. Marking

The containers shall be marked with the following information:

a) Name of the material and its colour;

b) Net content;

c) Date of manufacture and expiry;

d) Manufacturer's name and address; and

e) batch number

5. Sampling

The method of drawing representative samples of the material, number of tests to be performed and the method of finding out the criteria of conformity of the material to the requirements of the specification shall be as prescribed in **AnnexN**.

ANNEX A

Test for Smoothness and Line Continuity

A.1 **Procedure**

A.1.1 Write down numerous fast turns, reversals, ovals, and figure 8's with the ink under test filled in refills as prescribed in clause 6.1 on cream laid or cream wove paper. The tube shall be held at an inclination of 40° to the surface of the paper, while writing.

A.1.2 The ink shall not conform to the requirements of the test if there is excessive deposit of ink on the paper or writing tip, or variations of line width and intensity, or agglomerates of undispersed pigment or other irregularities. Furthermore, there should be good line continuity without splitting.

ANNEX B

Test for Starting Characteristics

B.1 **Procedure**

B.1.1 Rule a vertical line with the refill on a sheet of cream laid or cream wove paper at a distance of about 15 mm from the left edge.

Repeat the process immediately by ruling a further two vertical lines, each time starting from the line ruled parallel to the left-hand edge of the paper.

B.1.2 The ink shall satisfy the requirements of the test if the first line starts within 15 mm of the point or application of the refill, and all subsequent lines start from the point of application of the refill to the paper.

ANNEX C

Test for Drying Time

C.1 **Procedure**

C.1.1 Place a sheet of cream laid or cream wove paper on a smooth, flat surface and partially cover with a second sheet of paper. Place a round 100 g mass of 24 mm diameter with plane bottom surface on top of the second sheet. Write a five-letter word on the exposed portion of the bottom sheet. After five seconds draw the top sheet and the weight slowly across the writing on the bottom sheet.

C.1.2 The ink shall be considered to have passed the requirement of the test if there is no smudging of the ink on the paper.

ANNEX D

Test for Non-transferability

D.1 **Procedure**

D.1.1 Write several words on one-half of a sheet of cream laid or cream wove paper. Approximately five seconds after the writing immerse the half of the paper containing the writing in distilled water for approximately five seconds. Remove the, fold in such a manner that the writing shall be in contact with the dry half of the paper. Rub gently several times over the writing, then unfold the paper and examine.

D.1.2 The ink shall be considered to have satisfied the requirements of the test if there is no legible transfer of the .impressions on the other half of the paper.

ANNEX E

Test for Resistance to Water

E.1 **Procedure**

E .1.1 Write the equivalent of six-letter words on a sheet of cream laid or cream Wove paper. Immerse the paper in distilled water at room temperature for 48 h. Remove, allow the paper to dry and examine.

E.1.2 The ink shall satisfy the requirement of the test if the writing is not completely removed after the test.

ANNEX F

Test for Resistance to Chemical Bleach

F.1 **Reagent**

F .1.1 **Ink Eradicator**

Sodium hypochlorite solution of pH between 9.5 and 11.0.

F.2 **Procedure**

F.2.1 Write two five-letter words on a sheet of cream laid or cream wove paper. Apply the ink eradicator solution with a glass rod to the written words, rubbing the writing gently. Blot after five seconds to remove the excess of solution.

F.2.2 If the writing is not completely removed, repeat the above test after ten seconds and examine the writing.

F.3 The ink shall comply with the requirements of the test if it is not completely removed after two applications of the ink eradicator.

ANNEX G

Test for Resistance to Light

G.1 **General**

G.1.1 Draw 20 parallel lines approximately 150 mm long and 6 mm apart across the narrow dimension of a cream laid or cream wove paper. The lines shall be continuous and of uniform intensity. The writings shall be exposed to the radiation of an ultra violet lamp at a distance of 25 cm from the lamp for 24 h. The lamp shall be of 125 Watts, and long wave ultra violet region chiefly at 36550 nm.

G .1.2 The ink shall satisfy the test if it shows no more than slight fading when compared with the unexposed ink.

ANNEX H

Test for Writing on Grease

H.1 **Procedure**

H.1.1 Apply paraffin oil of viscosity not less than 65 centistokes in a thin film to make stripe of five centistokes width on a 20 cm sheet of paper. Place the oil stripe *over* a piece of blotting paper 7.5 cm x 25 cm and supported by a smooth level block of wood approximately 7.5 cm x 25 cm and 2.0 cm thick.

H.1. 2 Place a second piece of the blotting paper on the other side of the oil stripe and cover with a second smooth level block of wood of approximately the same size and place a two kilogram mass on the centre of the top block of wood. Allow the treated paper to remain between the weighed blotting paper for not less than 15 min. Then remove treated paper and repeat the blotting process with unused blotting paper for not less than 15 additional minutes.

Remove the treated paper, place on a pad of untreated paper containing not less than 50 sheets and perform the writing test prescribed in H. 1. 2.

H.1. 3 Write down through the oil - treated stripe on the treated paper starting from left to right through the 5 cm wide stripe. Write the equivalent of six five - letter words through the oil stripe six times.

H.2 The ink shall be considered to have satisfied the requirements of the test if the writing from beginning to end of each line shows the ink to be legible in at least tour continuous lines.

ANNEX J
Accelerated Service Test

J.1 **Procedure**

J.1.1 Suspend the cartridge filled with ink under test with point down in a humidity chamber and subject successively to each of the following conditions:

Exposure	Time (Hours)	Temperature ˚C	Relative Humidity (Per cent)
First	168	60	85-90
Second	48	-2	–

J.1. 2 The ink shall satisfy the requirements of the test if during writing it flows freely without leakage and spilling nor there is any change in colour, and it does not corrode the ball or writing tip.

Annex K

Feathering and Penetration

K.1 P**rocedure**

K.1.1 Write down six five-letter words with the ink under test filled in a refill as prescribed ,in Clause 6.1 on a sheet of cream laid or cream wove paper. After 48h, examine the sheet.

K. 2 The ink shall be considered to have satisfied the requirements of the test if there is no feathering or spreading or penetration to the reverse side of the paper.

ANNEX L

Determination of pH Value

M.1 **Procedure**

M.1.1 Weigh about 5 g of the ink and extract with hot distilled water. Cool it to room temperature and filter. Determine the pH of the filtrate at 27˚C ± 1 ˚C by a suitable pH meter.

M .2 The ink shall comply to this test if the pH is 6 to 6.5

ANNEX M

Determination of surface tension

M.1 **Apparatus**

M.1.1 Tensiometer - Torsion wire type.

M.1.2 **Procedure**

M.1.2.1 Weigh accurately 1.0 g of the sample ink and disperse it in 100ml hot distilled water. Filter and collect quantitatively the aqueous layer in 1000ml volumetric flask. Repeat the extraction of ink with hot distilled water at last three times. Make up the volume to one liter at $27^0C \pm 1\ ^0C$. Determine the surface tension of the aqueous layer by means of tensiometer.

M.2 The shall comply to the test if the surface tension value is between 35 to 40 dynes/cm

ANNEX N

Sampling of Ball Point Pen Ink and Criteria for Conformity

N.1 **General Requirements of Sampling**

N.1.1 Representative samples shall be drawn from each of the selected ink containers. For this purpose, the content of these containers shall be thoroughly mixed by suitable means.

N.1.2 Samples shall be placed in clean and dry bottles and shall be well protected from all possible modes of contamination.

N.1.3 Each sample container shall be sealed air-tight after filling and marked with full details of sampling.

N.2 **Scale of Sampling**

N.2.1 Lot

In a consignment all the containers of the same capacity, containing ink of the same colour and belonging to a single batch of manufacturer shall constitute a lot.

N.2.2 For ascertaining the conformity of the ink to the requirements of this specification, samples shall be tested for each lot separately. The number of containers to be selected at random from the lot depends on the size of the lot and shall be as given in Table 1.

TABLE 1- Number of ink containers to be selected in the sample.

.Lot size *N*	No of containers in the sample *n*
Up to 10	3
11 to 25	4
26 to 50	5
51 and above	6

N.2.2.1 In order to ensure randomness of selection of the ink containers, random number tables shall be used.

N.3 **Preparation of Test Samples and Number of Tests**

N.3.1 From each of the selected ink containers, about 100 ml ink shall be withdrawn and transferred to sample bottles. When taking samples from large containers, the ink may preferably be withdrawn from different depths of the container using suitable sampling instrument and these portions may then be mixed to form a representative sample of the container.

N.3.2 **Number of Tests**

Tests for all the characteristics shall be conducted on individual samples. Since the quality of the ink is decided ultimately by using it in a ball point pen refill, sufficient number of refills shall be tested for each sample as given below.

N.3.2.1 For smoothness and line continuity Clause 3.1.3, starting characteristics

Clause 3.1.4, drying time Clause 3.5 and non-transferability Clause 3.1.6, five refills shall be taken for each of the individual samples and each one of these refills shall be tested for these characteristics. A sample shall be considered to have failed if two or more of the refills corresponding to that sample do not pass in anyone or more of the four different tests mentioned above.

N.3.2.2 For all the other characteristics mentioned in Clause 3, two refills shall be tested for each of the individual samples. A sample shall be considered to have passed if both the refills satisfy the requirements for these characteristics.

N.4 **Criterion for Conformity of Lot**

N.4.1The lot shall be considered to be acceptable according to the requirements of this specification if all the samples pass the different tests under N.3.2.1 and N.3.2.2.