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SPECIFICATION FOR

BLACK OFFSET INK FOR GENERAL PURPOSES

SRI LANKA STANDARDS INSTITUTION

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FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1987-10-08, after the draft, finalized by the Drafting Committee on Printing Inks, had been approved by the Chemicals Divisional Committee.

The purpose of this specification is to complement the specification for black letterpress ink, for general purposes (SLS 341). Black offset ink covered in this specification is intended for printing books, magazines and periodicals on offset papers.

Offset ink dries by oxidation/polymerization and absorption. There are two types of emulsification of offset inks namely, oil-in-water emulsification and water-in-oil emulsification. A method of assessing the resistance of the ink to emulsification in fountain solution has therefore been included in this specification.

All standard values given in this specification are in SI units.

For the purpose of deciding whether a particular requirement of this specification is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with CS 102. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this specification.

In the preparation of this specification, valuable assistance derived from the relevant publications of the International Organization for Standardization, British Standards Institution, Indian Standards Institution and Federal Supply Service of the General Service Administration of the United States of America is gratefully acknowledged.

1 SCOPE

This specification prescribes the requirements and methods of sampling and test for black offset ink, for general purposes.

2 REFERENCES

CS 3 Paper sizes

CS 102 Presentation of numerical values

SLS 339 Substances of paper and paper board

SLS 341 Black letterpress ink, for general purposes

SLS 489 Glossary of terms for paints

3 DEFINITIONS

For the purpose of this specification the definitions given in **SLS 489**, in addition to the following, shall apply:

3.1 fountain solution: A solution to prevent the non-printing areas of the plate from receiving ink.

3.2 impression: The product resulting from one cycle of the printing machine.

3.3 offset paper: A paper generally free from loading and usually with a matt surface, with dimensional stability.

3.4 sharpness: Similarity of the geometry of the image to type face.

3.5 show through: The degree to which a printed ink film is visible through paper, due to low opacity of the paper.

3.6 strike through: The visible effect seen on the reverse side of the sheet, due to penetration of ink or vehicle into or through the paper.

4 REQUIREMENTS

4.1 General requirements

The ink shall be uniform, homogeneous, non abrasive and free from skins, lumps and other separated materials which will not disperse in the vehicle.

4.2 Performance

4.2.1 The ink shall produce acceptable reproductions on both sides of white offset printing paper of nominal substance 63 g/m^2, when run on an offset printing machine (see Note). The ink shall produce presentable impressions which are clean, clear, without strike-through or show-through sufficient to interfere with legibility of the finished work on both sides of the paper.

NOTE - It is also permissible to use laboratory printability apparatus designed to determine suitability for printing.

4.2.2 The ink shall dry satisfactorily when printed on the paper specified in 4.2.1. When printed copies are stacked there shall be no objectionable transfer of ink from one sheet to the next.

4.2.3 The ink shall adhere well to the paper so that it will not smudge or chalk.

4.2.4 The ink shall work satisfactorily in the duct and shall not show signs of flying during operation.

4.3 Colour

The colour of the impressions produced on the paper (see 4.2.1) shall be black.

4.4 Separation

Ink shall show no signs of separation of the pigment and vehicle when left in the duct during the idle period of the machine. The idle periods shall not exceed 8 hours for the purpose of this requirement.

4.5 Stability

The ink shall show no film formation, hardening or caking when tested as prescribed in Appendix A.

4.6 Resistance to fading

The impression made by the ink, shall remain unchanged and shall be readable when tested by the method prescribed in Appendix B.

4.7 Resistance to smudging and moisture

The ink shall be resistant to smudging and moisture when tested as prescribed in Appendix C.

4.8 Resistance to break down in fountain solution

The aqueous layer obtained shall not show any discolouration and the water absorbed by the ink shall not be more than 5 per cent when tested as prescribed in Appendix D.

4.9 Consistency

The consistency of the ink shall be such that it shall be capable of easy distribution in the ink duct of the machine. After a few operations the ink shall neither run/drip off the cylinders nor shall it be stiff thus making it difficult to be re-distributed on the cylinders.

4.10 Shelf life

The ink in unopened containers shall be in a usable condition after storage under normal conditions for a period of 6 months from the date of manufacture.

5 PACKAGING

5.1 The ink shall be packed in air-tight containers as agreed to between the purchaser and the supplier.

5.2 Not more than 5 per cent ullage shall be allowed in the packed containers.

6 MARKING

6.1 Each container shall be marked legibly and indelibly with the following:

a) Name and description of the material;

b) Name and address of the manufacturer, (including country of origin);

c) Registered trade mark, if any;

d) Brand name, if any;

e) Net mass, in grams or kilograms of the material; and

f) Date of manufacture or batch number.

6.2 The containers may also be marked with the Certification Mark of the Sri Lanka Standards Institution illustrated below on permission being granted for such marking by the Sri Lanka Standards Institution.

NOTE - The use of the Sri Lanka Standards Institution Certification Mark (SLS Mark) is governed by the provisions of the Sri Lanka Standards Institution Act and the regulations framed thereunder. The SLS Mark on products covered by a Sri Lanka Standard is an assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control, which is devised and supervised by the Institution and operated by the producer. SLS marked products are also continuously checked by the Institution for conformity to that standard as a further safeguard. Details of conditions under which a permit for the use of the Certification Mark may be granted to manufacturers or processors may be obtained from the Sri Lanka Standards Institution.

7 SAMPLING

7.1 Lot

In any consignment all containers belonging to one batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture, the containers belonging to the same batch shall be grouped together and each such group shall constitute a separate lot.

7.2 Scale of sampling

7.2.1 Samples of ink shall be tested from each lot for ascertaining its conformity to the requirements of this specification.

7.2.2 The number of containers to be selected from a lot shall be in accordance with Table 1.

TABLE 1 - Scale of sampling

Number of containers in the lot	Number of containers to be selected
Up to 100	5
101 to 500	6
501 and above	7

7.2.3 The containers shall be selected at random. In order to ensure randomness of selection, random number tables as given in **SLS 428** shall be used.

7.3 Reference sample

If a reference sample is required the number of containers to be selected from each lot shall be three times the value given in Table 1. One-third of this sample shall be retained by the purchaser, one third by the supplier and one third shall be kept at a place agreed to between the purchaser and the supplier to be used in case of dispute between the two.

7.4 Number of tests

7.4.1 Each container selected as in **7.2.2** shall be inspected for packaging and marking requirements.

7.4.2 Three containers shall be selected at random from the containers selected as in **7.2.2** and mixed to form a composite sample. The composite sample thus obtained shall be tested for the requirements given in **4.2, 4.3, 4.4, 4.6, 4.7** and **4.9.**

7.4.3 The remaining containers shall be tested individually for the requirements given in **4.5** and **4.8.**

NOTE - If necessary, one container shall be selected from the lot and tested for shelf life.

8 METHODS OF TEST

Tests shall be carried out as prescribed in Appendices **A** to **D.**

9 CONFORMITY TO STANDARD

A lot shall be declared as conforming to the requirements of this specification, if the following conditions are satisfied:

9.1 Each container inspected as in 7.4.1 satisfies the relevant requirements.

9.2 The composite sample tested as in 7.4.2 satisfies the relevant requirements.

9.3 Each container tested as in 7.4.3 satisfies the relevant requirements.

APPENDIX A

TEST FOR STABILITY

Take about 10 g of the ink sample in a clean shallow vessel approximately 60-mm in diameter and 8-mm in depth and place in an oven at 60 ± 2 °C for 2 hours. At the end of this period there shall be no skinning, hardening or caking.

APPENDIX B

TEST FOR RESISTANCE TO FADING

Take four specimens of size 297 mm x 210 mm (see CS 3) printed on one side of the specified paper (see 4.2.1) with equally good impressions. Expose two of these specimens with the printed side up to an ultraviolet lamp at a distance of 0.25 m from the source for 48 hours. The lamp should emit radiations at 366 nm so that intensity at 0.9 m from the lamp is approximately 4.5 W/m^2. Keep the other two specimens for reference, away from the ultraviolet lamp. There shall be no appreciable change in intensity of the impressions on the paper exposed to ultraviolet light when compared with the two specimens reserved for reference.

APPENDIX C

TEST FOR RESISTANCE TO SMUDGING AND MOISTURE

C.1 RESISTANCE TO SMUDGING

Take a specimen of size 297 mm x 210 mm (see CS 3) printed on one side of the specified paper (see 4.2.1) and allow it to air dry for 4 minutes. Place on a smooth, flat surface with the printed side up and cover with a clean sheet of blank printing paper (see 4.2.1). Place a 100-g circular mass of 33-mm diameter on one edge of the paper and draw the clean sheet of paper and the mass slowly across the printed sheet of paper. The ink shall be considered to have passed the test if there is no smudging.

C.2 RESISTANCE TO MOISTURE

Take a specimen of size 297 mm x 210 mm (see CS 3) printed on one side of the specified paper (see 4.2.1) and allow it to air dry for 4 minutes, dip in water for 4 seconds to 5 seconds and perform the smudge test as specified in C.1.

APPENDIX D

TEST FOR RESISTANCE TO BREAKDOWN IN FOUNTAIN SOLUTION

D.1 MATERIAL

D.1.1 Fountain solution

Acidic fountain solution of the following composition:

85 per cent phosphoric acid	2 ml
Gum arabic (powdered)	1 g
Distilled water	98 ml

D.2 PROCEDURE

Weigh, to the nearest milligram, approximately 10 g of the material in a heavy walled glass beaker and add 2 ml of fountain solution of 5.5 pH. Stir vigorously for 15 minutes. Separate the aqueous layer and note the appearance of the aqueous layer. Dry the beaker in an oven at 50 ± 1 °C for about 4 hours, cool and weigh. Repeat the drying cooling and weighing operations until the difference in mass between two successive weighings does not exceed one milligram.

D.3 CALCULATION

$$\text{Water absorbed by the material, per cent by mass} = \frac{(m_2 - m_1)}{m_1} \times 100$$

where,

m_1 = mass, in g, of the material taken for the test; and

m_2 = mass, in g, of the material after drying.

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

Further particulars of the terms and conditions of the permit may be obtained from the Sri *Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*

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SRI LANKA STANDARDS INSTITUTION

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The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

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All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

Printed at the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.