SRI LANKA STANDARD 660:1984
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SPECIFICATION FOR
GENERAL PURPOSE PAPER ADHESIVES

SRI LANKA STANDARDS INSTITUTION

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SLS 660:1984

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SRI LANKA STANDARD

SPECIFICATION FOR GENERAL PURPOSE PAPER ADHESIVES

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1984-10-31, after the draft, finalized by the Drafting Committee on Adhesives had been approved by the Chemicals Divisional Committee.

Moderately quick setting adhesive are employed for general office use. They are also widely used in schools and households. This specification is expected to assist the manufacturers and consumers in choosing a material of suitable quality.

While no specific requirements have been laid down for insect-repellency, it is recommended that the material should be insect-repellent and should have neither a bleaching nor deepening effect, on the paper on which it is used.

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 should be the same as that of the specified value in this standard.

In the preparation of this specification, the assistance derived from the publications of the American Society for Testing and Materials, Canadian Standard Association and Indian Standards Institution is gratefully acknowledged.

1 SCOPE

1.1 This specification prescribes the requirements, methods of sampling and test for adhesives used for joining paper to paper or paper to other surfaces in general use.

1.2 This specification does not cover quick setting adhesives and remoistenable adhesives.

2 REFERENCES

CS 102 Presentation of numerical values

SLS 428 Random sampling methods

3 REQUIREMENTS

3.1 General requirements

3.1.1 The material shall be in the form of a paste or liquid, uniform in consistency and free from lumps, dirt and suspended matter. The material and its dried film shall be free from objectionable odour. It shall be non-toxic and shall not cause irritation of the skin.

3.1.2 The material shall also continue to satisfy the requirements given in 3.1.1, 3.2 and 3.3 when stored in original unopened containers for a minimum period of one year from the date of manufacture.

3.2 Resistance to mould growth

When tested and examined as prescribed in 7.5 the adhesive shall show no evidence of mould growth, separation of layers or sedimentation.

3.3 Other requirements

The material shall also comply with the requirements given in Table 1 when tested according to the relevant methods given in Column 4 of Table 1.

TABLE 1 - Requirements for paper adhesives

Sl. No. (1)	Characteristics (2)	Requirement (3)	Method of test (Ref. to Cl. No) (4)
i	pH value	4 to 10	7.1
ii	Bond permanency	To pass test	7.2
iii	Brittleness and moisture absorption of the dried film	To pass test	7.3
iv	Stability at 37 ^{o}C	To pass test	7.4

4 PACKAGING AND MARKING

4.1 The material shall be packed in suitable containers as agreed to between the purchaser and the supplier. When the container is fitted with a dispenser it shall be of appropriate softness so that the adhesive flows out with the application of gentle pressure on the applicator.

4.2 The containers shall be marked legibly and indelibly with the following:

a) Name of the product;

b) Name and address of the manufacturer;

c) Registered trade mark, if any;

d) Net mass, in grams, (for pastes), or net volume, in millilitre (for liquids);

e) Directions for storage and use, where necessary;

f) Date of manufacture; and

g) Batch number of code number.

4.3 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.

5 SAMPLING

5.1 Lot

All the containers of the same size, containing adhesives, belonging to one batch of manufacture shall constitute a lot.

5.2 General requirements of sampling

5.2.1 Samples shall not be taken in an exposed place to avoid inclusion of foreign matter.

5.2.2 The material in each container selected from the lot shall be mixed thoroughly before drawing samples. If the container is fitted with a dispenser initial portion shall be discarded while collecting the sample.

5.2.3 Sampling instrument shall be cleaned when used.

5.2.4 The sample shall be placed in a clean and dry glass container. The sample container shall be sealed air-tight after filling and marked with necessary details of sampling.

5.2.5 When drawing samples for microbiological examination (3.2) the following precautions shall also be observed.

5.2.5.1 Samples shall be drawn under aseptic conditions.

5.2.5.2 The sampling instrument and sample containers shall be sterilized using an appropriate method.

5.2.5.3 If storage is necessary, the samples shall be stored at room temperature and testing shall be carried out as soon as possible.

5.3 Scale of sampling

5.3.1 The conformity of a lot to the requirements of this specification shall be ascertained on the basis of tests carried out on the samples selected from the lot.

5.3.2 The number of containers to be selected from the lot shall be in accordance with Table 2.

TABLE 2 - Scale of sampling

Number of containers in the lot (1)	Number of containers to be selected	
	Volume or mass of the container is 50 ml or 50 g or less (2)	Volume or mass of the container is more than 50 ml or 50 g (3)
Up to 100	10	5
101 to 150	12	8
151 to 300	15	12
301 to 500	20	16
501 and above	25	20

5.3.3 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.

5.4 Composite samples

5.4.1 Using an appropriate sampling instrument an equal quantity of material shall be drawn from each container selected as in 5.3 and mixed thoroughly to form a composite sample of about 150 g under the conditions specified in 5.2.5.

5.4.2 A separate composite sample of 100 g shall be prepared after drawing material to prepare the composite sample described in 5.4.1.

6 NUMBER OF TESTS

6.1 Each container selected as in 5.3.2 shall be examined for packaging and marking requirements.

6.2 Tests for requirements specified in 3.3 shall be carried out on the composite sample prepared as in 5.4.2.

6.3 Test for resistance to mould growth shall be carried out on the composite sample prepared as in 5.4.1.

7 METHODS OF TEST

7.1 Determination of pH value

7.1.1 Determine the pH value of the material at ambient temperature by any suitable method as agreed to between the purchaser and the supplier.

7.2 Test for bond permanency

7.2.1 *Procedure*

Take six pieces of size 50 mm x 60 mm of each of

a) Offset cartridge paper;

b) Machine glazed paper;

c) Coated art paper;

d) Machine finished printing paper; and

e) Kraft paper.

Mark off with a pencil or by folding a strip 10 mm wide leaving an area 50 mm x 50 mm square. Pour approximately 0.5 ml of the adhesive to be tested on the paper using a graduated pipette or syringe (on the glazed and coated side in the case of machine glazed paper and coated art paper respectively) and spread it evenly over the 50 mm x 50 mm square area with a squeegee, spatula or similar non-absorbent implement, leaving an ungummed flap 10 mm wide. Stick the pieces on to a larger piece of

a) The same paper;

b) Strawboard;

c) Packing case wood;

d) Mul piece cloth;

e) Pane glass; and

f) Galvanized iron sheet by applying a uniform pressure on the gummed paper using the thumb. Keep the specimens for one hour at room temperature with relative humidity of 65 ± 5 per cent. Test by gripping the free 10 mm wide flap and pulling the piece apart with steady pull.

7.2.2 The material shall be considered to have passed the test, if each piece tears during stripping, leaving the fibres still attached over at least 50 per cent of the original area of attachment.

7.3 Test for brittleness and moisture absorption of the dried film

7.3.1 *Procedure*

Take 1 millilitre of the adhesive make a thick film on kraft paper 25 mm x 100 mm in size and keep it at room temperature with a relative humidity of 65 ± 5 per cent. After one hour, roll the paper on a wooden roller of approximately 25 mm diameter, first with the coated side up and next with the coated side down.

7.3.1.1 The material shall be considered to have passed the test if the film and the paper do not show any sign of cracking and the paper does not stick to the roller.

7.4 **Test for stability at 37 °C**

7.4.1 *Procedure*

Place approximately 25 ml of the material in a petri dish of 100 mm diameter, cover and keep it in an incubator maintained at a temperature of 37 ± 1 °C for 14 days.

7.4.1.1 The material shall be considered to have passed the test if there is no separation into layers or sedimentation in the material.

7.5 **Test for resistance to mould growth**

Test shall be carried out as prescribed in Appendix A.

8 CONFORMITY TO STANDARD

The lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied.

8.1 Each container examined as in 6.1 satisfy the relevant requirements.

8.2 The composite samples tested as in 6.2 and 6.3 satisfies the relevant requirements.

APPENDIX A

TEST FOR RESISTANCE TO MOULD GROWTH

A.1 PRINCIPLE

Resistance to mould growth is determined by inoculating the adhesive with the prescribed test organism and examining it for mould growth, separation into layers or sedimentation.

A.2 APPARATUS AND MATERIALS

A.2.1 *Jars*

A.2.1.1 *Mason jars,* Two round, quart-size with tight covers about 50 mm in inside diameter and 50 mm in height, or

A.2.1.2 *Erlenmeyer flasks two,* 100-ml.

A.2.2 *Petri dishes*

A.2.3 *Screw cap bottles*, and caps suitable for sterilizing the culture medium.

A.2.4 *A thermometer*, having a range from -2 °C to 68 °C.

A.2.5 *Cylinder*, of 500 ml capacity graduated in 5 ml subdivisions.

A.2.6 *Platinum loop*.

A.2.7 *Sterilizer* (Autoclave), having a 103 kPa minimum exit steam pressure.

A.2.8 *Temperature chamber*, maintained at 28 ± 2 °C.

A.2.9 *Tartaric acid solution*, sterile 10 per cent.

A.2.10 *A desiccator*, about 250 mm in inside diameter and 200 mm. in height, with perforated porcelain plates to support the test specimens.

A.3 TEST ORGANISM

Cultures of the *Aspergillus niger* strain shall be used.

A.4 PREPARATION OF CULTURE MEDIUM

A.4.1 Culture medium for preparation of inoculae

Prepare a culture medium of the following composition.

a) Potato dextrose agar (or malt agar dehydrated as instructed by the manufacturer) 39 g ; and

b) Distilled water 1 000 ml.

Place the potato dextrose agar or malt agar and the distilled water in a chemically resistant glass beaker and soak at room temperature for about 15 min. then heat to boiling and continue the boiling for 1 to 2 min. Stir the mixture constantly while heating, to prevent scorching. Place 300 ml of the hot solution in each bottle, close them tightly with the screw caps, and sterilize for 15 min at 121 °C exit steam temperature (equivalent to 103 kPa pressure). To reduce the pH of the medium to 3.5 ± 0.1 subsequent to sterilization, add to each bottle the specified amount of sterile tartaric acid (10 per cent solution). Usually 1 ml acid for 100 ml medium will be sufficient. Close the bottle immediately after the acid has been added, and swirl them to mix the acid with the medium. Pour 15 ml of the well-mixed culture medium into each of the sterilized Petri dishes, and cover them immediately. Keep at room temperature until the culture medium has gelled.

NOTE - The medium should never be heated after acidification, to prevent hydrolysis of the agar and loss of its solidifying properties.

A.5 PREPARATION OF INOCULAE

A.5.1 Use a flame-sterilized platinum loop to transfer portions of the test organism to the culture plates. Inoculate each plate with the test organism.

NOTE - Care should be taken to ensure that biologically aseptic conditions prevail throughout the preparation of the inoculae.

A.6 INCUBATION

Insert the inoculated covered plates, and place them in a desiccator filled to a depth of 25 mm with sterile distilled water. Incubate the desiccator in the temperature chamber at 28 ± 2 °C for 3 to 10 days.

A.7 PRESERVATION OF CULTURES

The inverted culture plates can be kept in the desiccator at room temperature for about one month.

A.8 PREPARATION OF TEST SPECIMENS

Prepare fresh, in accordance with the directions provided by the manufacturer, about 150 g of the adhesive to be tested.

A.9 INOCULATION

A.9.1 Aseptically place approximately 50 g of the prepared adhesive in each of the two sterilized Mason Jars (or 250-ml Erlenmeyer flasks). One specimen shall serve as a control. Inoculate the other specimen as follows: Rotate a sterile cotton swab lightly over the surface of one of the mould culture, prepared as in A.5 and A.6, until the swab is coated with mould spores. Tap the swab on the edge of the open jar to sprinkle the mould spores evenly over the surface. Close both jars tightly. Place both specimens in the temperature chamber at high relative humidity (about 95 per cent) for 14 days. At the end of this period examine the adhesive for evidence of mould growth, separation of layers or sedimentation.

NOTE - Care should be taken to ensure that all apparatus coming into direct contact with the adhesive is sterile, and employ biologically aseptic techniques throughout the inoculation.

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.

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The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

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.

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

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