SRI LANKA STANDARD 844 : 1989

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SPECIFICATION FOR

ABRASIVE PAPER

SRI LANKA STANDARDS INSTITUTION

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SLS 844:1989

Gr. 7

SRI LANKA STANDARDS INSTITUTION
53, Dharmapala Mawatha,
Colombo 3,
Sri Lanka.

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SRI LANKA STANDARD

SPECIFICATION FOR ABRASIVE PAPER

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council, of the Sri Lanka Standards Institution on 1989-05-12, after the draft, finalized by the Drafting Committee on Abrasive Paper had been approved by the Chemicals Divisional Committee.

The requirement given in 5.2 of this specification calls for agreement between the purchaser and the supplier.

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 an 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 the assistance obtained from the publications of the American National Standards Institute, the British Standards Institution, the Canadian Government Specification Board and the Bureau of Indian Standards is gratefully acknowledged.

1 SCOPE

This specification prescribes the requirements and methods of sampling and test for abrasive paper for general manual applications.

2 REFERENCES

CS 102 Presentation of numerical values.
CS 124 Test sieves.
SLS 428 Random sampling methods.
SLS 474 Testing of paper and board for tensile strength.

3 DEFINITIONS

For the purpose of this specification, the following definitions shall apply:

3.1 abrasive : A natural or manufactured substance that is reduced by crushing to specific grades (see 3.8).

3.2 **backing** : The support or platform to which the abrasive is bonded by means of adhesives.

3.3 **closed coat** : A coat in which the abrasive grains completely cover the surface of the backing.

3.4 **open coat** : A coat in which the abrasive grains are spaced apart from each other and coverage shall be not less than two-thirds of the surface area.

3.5 **cross direction** : The direction in the plane of a paper at right angles to the machine direction.

3.6 **machine direction** : The direction in a paper corresponding to the direction of travel of the web on the paper machine.

3.7 **flint** : Abrasive obtained by crushing hard quartz, quartzite or flint mineral.

3.8 **grade** : Number indicating the size of abrasive grains.

3.9 **ream** : 500 sheets of abrasive paper of specified grade.

4 TYPES

Abrasive paper shall be of the following two types:

a) Flint abrasive paper; and
b) Glass abrasive paper.

5 REQUIREMENTS

5.1 Materials

5.1.1 *Abrasive*

Abrasive shall be crushed from clean hard quartz, quartzite, flint mineral or glass, free from extraneous material.

5.1.2 *Adhesive*

Suitable adhesive which satisfies the requirement specified in 5.6 shall be used.

5.1.3 *Backing*

Kraft paper having a minimum grammage (substance) of 119 g/m^2 shall be used as backing.

NOTE - The grammage (substance) of 119 g/m^2 corresponds to kraft paper of nominal grammage (substance) of 125 g/m^2. Paper having higher nominal substance may also be used.

5.2 **Workmanship**

Abrasive paper shall have a closed coating or open coating as agreed to between the purchaser and the supplier. It shall also be free from imperfections that may adversely affect its performance.

5.3 **Form and dimensions**

Abrasive paper shall be supplied in sheets of size 230 mm x 280 mm. A tolerance of $\pm$ 3 mm shall be permitted on each dimension.

5.4 **Grades**

5.4.1 *Flint abrasive paper*

Flint abrasive paper shall be supplied in grades specified in Column 1 of Table 1. Grades shall conform to grading specified in Table 1, when determined according to the method given in Appendix A.

TABLE 1 - Grading of flint abrasive

Grade	Sieve aperture size µm			
	Nil retention	Maximum 25 % retention	Minimum 50 % retention	Maximum 20 % passing through
(1)	(2)	(3)	(4)	(5)
0	125	106	75	53
1	250	212	150	106
1 1/2	425	355	212	150
2	600	500	355	250
2 1/2	850	710	600	425
3	1000	850	710	500

5.4.2 *Glass abrasive paper*

Glass abrasive paper shall be supplied in grades specified in Column 1 of Table 2. Grades shall conform to grading specified in Table 2, when determined according to the method given in Appendix A.

TABLE 2 - Grading of glass abrasive

Grade (1)	Sieve aperture size µm			
	Nil retention (2)	Maximum 25 % retention (3)	Minimum 50 % retention (4)	Maximum 20 % passing through (5)
00	90	-	-	-
0	106	75	53	45
1	125	106	75	63
1 1/2	180	150	106	90
2	425	355	212	150
2 1/2	710	600	500	355
3	850	710	600	425

5.5 Tensile strength of abrasive paper

Tensile strength of the abrasive paper shall be not less than 7.8 kN/m for machine direction and 4.3 kN/m for cross direction, when determined as given in SLS 474 and 8.1 of this specification.

5.6 Adhesive strength of abrasive

Abrasive grains shall not leave the backing in less than 10 strokes, when determined according to the method given in Appendix B.

5.7 Mass of ream of abrasive paper

Mass of ream of abrasive paper excluding the wrapper shall conform to the minimum mass given in Table 3.

TABLE 3 - Mass of reams of abrasive paper

Grade (1)	Mass per ream kg, min. (2)
00	6.5
0	7.0
1	7.5
1 1/2	9.0
2	11.5
2 1/2	20.5
3	23.0

6 PACKAGING AND MARKING

6.1 Packaging

Ten or twenty bundles of twenty five sheets shall be wrapped with kraft paper or any other suitable material to make half-ream or ream packages, respectively.

6.2 Marking

6.2.1 Each sheet of abrasive paper shall be legibly and indelibly marked with the following:

a) Name of the product with the prefix "Flint" or "Glass" as appropriate;
b) Grade of abrasive paper;
c) Name and address of the manufacturer/supplier and country of origin;
d) Registered trade mark and/or brand name, if any; and
e) Batch or code number.

6.2.2 Each package shall be legibly and indelibly marked with the following:

a) Name of the product with the prefix "Flint" or "Glass' as appropriate;
b) Grade of abrasive paper;
c) The words "Ream" or "Half-Ream", as appropriate;
d) Name and address of the manufacturer/supplier and country of origin; and
e) Registered trade mark and/or brand name, if any.

7 SAMPLING

7.1 Lot

In any consignment all the packages of abrasive paper of the same grade and belonging to one batch of manufacture or supply shall constitute a lot.

7.2 Scale of sampling

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

7.2.2 The number of packages to be selected from a lot shall be in accordance with Table 4.

TABLE 4 - Scale of sampling

No. of packages in the lot (1)	No. of packages to be selected (2)
Up to 10	2
11 to 20	3
21 to 30	4
31 to 50	5
51 to 100	7
101 and above	10

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

7.3 Number of tests

7.3.1 Each package selected as in 7.2.2 shall be inspected for marking and packaging requirements.

7.3.2 Each package selected as in 7.2.2 shall be tested for the mass of ream of abrasive paper.

7.3.3 Ten sheets shall be selected from each package selected as in 7.2.2 and examined for marking requirements.

7.3.4 As far as possible an equal number of sheets shall be selected from each package selected as in 7.2.2 to form a sample of about seventy sheets and the sample so selected shall be tested for grading of abrasive.

7.3.5 Three sheets shall be selected from each package selected as in 7.2.2 and tested for dimensional requirements.

7.3.6 Five sheets shall be selected from each package selected as in 7.2.2 and tested for the tensile strength of abrasive paper.

7.3.7 Two sheets shall be selected from each package selected as in 7.2.2 and tested for the adhesive strength of abrasive.

8 METHODS OF TEST

Tests shall be carried out according to the methods given in SLS 474 and Appendix A and Appendix B of this specification.

8.1 Test pieces of required size as given in SLS 474 shall be cut from the finished abrasive paper for the determination of tensile strength.

9 CRITERIA FOR CONFORMITY

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

9.1 Each package examined as in 7.3.1 and 7.3.2 satisfies the relevant requirements.

9.2 Each sheet examined as in 7.3.3 satisfies the relevant requirements.

9.3 The sample tested as in 7.3.4 satisfies the relevant requirements.

9.4 The values of the expressions $\bar{x} - 0.9s$ (see Notes) and $\bar{x} + 0.9s$ calculated using the test results on dimensions lie between the relevant specification limits.

NOTES

1 *Mean* ($\bar{x}$) = *The sum of values of the observations divided by the number of observations.*

2 *Standard deviation* (s) = *The positive square root of the quotient obtained by dividing the sum of squares of the deviations of the observations from their mean by one less than the number of observations in the sample.*

9.5 The value of the expression $\bar{x} - 0.9s$ calculated using the test results on tensile strength is not less than the relevant specification limits.

9.6 Each sheet tested as in 7.3.7 satisfies the relevant requirements.

APPENDIX A
DETERMINATION OF GRADING OF ABRASIVE GRAINS

A.1 APPARATUS

A.1.1 *Test sieves* , of 200 mm mean internal diameter conforming to BS 124.

A.1.2 *Sieve shaking machine* , which rotates at 290 rounds per minute and taps the sieves at a rate of 156 taps per minute.

A.2 PROCEDURE

A.2.1 Recovery of abrasive grains

Take a sufficiently large sample of abrasive paper to ensure recovery of at least 125 grams of abrasive grains for sieving. Place the sample in a beaker and cover with hot water. When the glue is entirely softened and most of the abrasive grains have fallen off, wash the sample with a jet of hot water (about 50 °C) and rub or brush it gently to make certain that all the grains are removed.

Filter through a Buchner funnel equipped with a No. 4 Whatman filter paper, or its equivalent collecting the abrasive grains on the filter paper. If the filter clogs from the clay or other filling material present in the backing, wash the abrasive grains on the filter paper back into the beaker and use a new filter paper for the filtration repeating this procedure if necessary. Wash the abrasive grains with hot water (about 50 °C) at least four times.

Wash the abrasive grains on the filter paper back into the beaker with hot water (about 50 °C) and add an equal amount of concentrated hydrochloric acid. Heat to boiling and boil for about 10 minutes, agitating the abrasive grains once or twice during this time. Dilute and filter through a No. 4 Whatman filter paper or its equivalent, in a Buchner funnel. Wash the abrasive grains three times with hot water (about 50 °C) and once with at least 50 millilitres of alcohol. Dry the abrasive grains and the filter paper in an oven at 110 $\pm$ 5 °C. Brush the abrasive grains lightly from the filter paper into a crucible (either nickel or porcelain), leaving the bulk of any filling material from the backing on the filter paper. With occasional stirring, ignite the abrasive grains until all combustible material is burnt to an ash in a muffle furnace at 600 $\pm$ 20 °C.

A.2.2 Grading of abrasive grains

Arrange the sieves (A.1.1) in sets, appropriate to the grade being tested (see Tables 1 and 2).

Sieve 100 grams of abrasive grains for 5 minutes in the sieve shaking machine (A.1.2).

Record the percentage retention or passing through as appropriate (see Tables 1 and 2).

APPENDIX B
DETERMINATION OF ADHESIVE STRENGTH OF ABRASIVE

B.1 APPARATUS

B.1.1 *Device suitable for the purpose*, having the following features (see Fig. 1);

a) Base plate having a minimum dimension of 130 mm x 175 mm, provided with an arrangement for horizontal reciprocating movement with a displacement of 100 $\pm$ 5 mm at a rate of 15 strokes per minute (see Note) and clamps to fix the test specimen.

NOTE - A stroke is a complete cycle of a to-and-fro movement.

b) Fixed block having a mass of 500 $\pm$ 25 grams and a dimension of 60 mm x 120 mm (tolerance on each dimension should be $\pm$ 2 mm) resting on the base plate with its shorter dimension parallel to the direction of movement of the base plate. Fixed block should be mounted in such a manner that it can move freely in the vertical direction and rotate freely about a horizontal axis perpendicular to the direction of movement of the base plate.

Fixed block should be provided with clamps to fix the test specimen.

B.2 TEST SPECIMEN

Cut test specimens as described as follows, from a sheet of abrasive paper.

i) Test specimen A - Large enough to fix to the fixed block.
ii) Test specimen B - Large enough to fix to the base plate.

B.3 PROCEDURE

Condition the test specimens (B.2) at 27 ± 2 °C and 65 ± 5 per cent relative humidity for 4 hours.

Fix the test specimen A to the fixed block (B.1.1.b) and the test specimen B to the base plate (B.1.1.a) of the device such that the abrasive surfaces of the test specimens are facing each other.

Operate the device at a rate of 15 strokes per minute. Examine the test specimen A at the end of the tenth stroke for freedom from leaving the abrasive grains from the backing. If necessary, use a magnifying glass of about x 10 magnification to examine the test specimen.

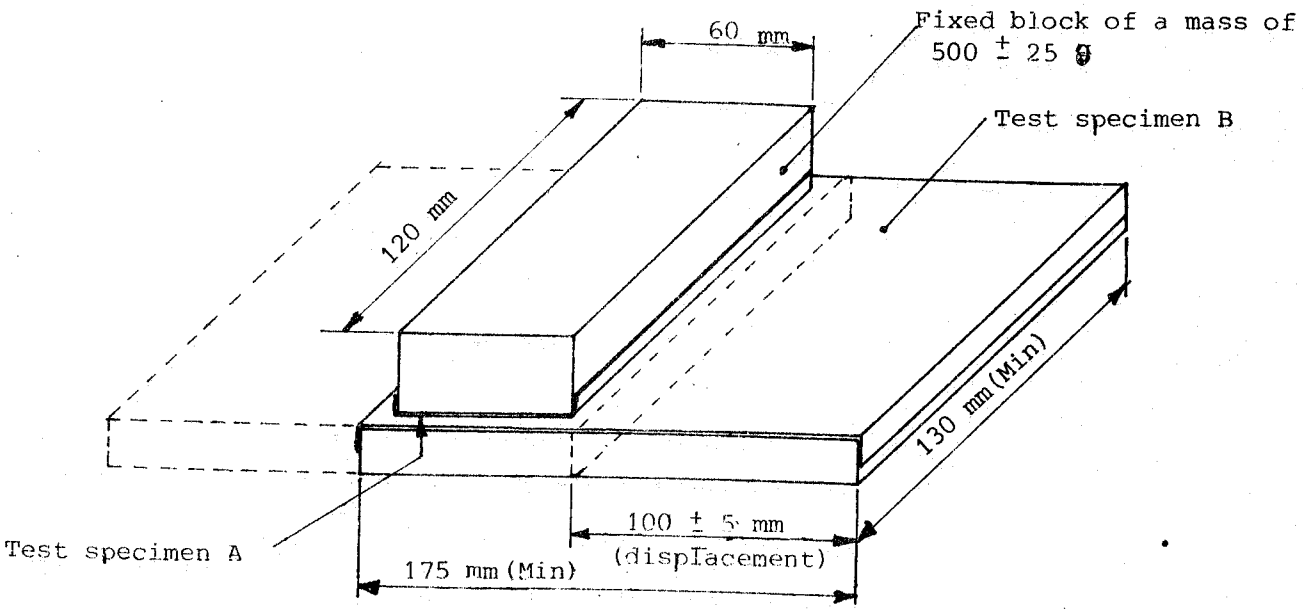

FIGURE 1 - Device for determination of adhesive strength of abrasive.

SRI LANKA STANDARDS INSTITUTION

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