SRI LANKA STANDARD 562 : 1982

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SPECIFICATION FOR PAINTERS' AND DECORATORS' BRUSHES

BUREAU OF CEYLON STANDARDS

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Gr.8

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Sri Lanka.

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FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Bureau of Ceylon Standards on 1982-05-24 after the draft, finalized by the Drafting Committee on Paint Brushes had been approved by the Chemicals Divisional Committee.

In this specification, tests for bristles, requirement for mass of bristles to be used for each size of brush, timbers to be used for handles and their botanical nomenclature and other details of workmanship and finish have been incorporated. This specification does not cover brushes made out of coir fibre.

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 should 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 British Standards Institution and Indian Standards Institution is gratefully acknowledged.

1 SCOPE

This specification specifies dimensional requirements for a range of Painters' and Decorators' brushes. It prescribes the requirements and the methods of sampling and test for these brushes. The items dealt with are

a) paint brushes

b) varnish brushes

c) flat distemper brushes

2 REFERENCES

CS 102 Presentation of numerical values
CS 159 Code of practice for seasoning of timber
SLS 428 Random sampling methods

3 TERMINOLOGY

3.1 hair: The hair of any animal.

3.2 bristle: The hair of the hog, pig or boar only.

4 REQUIREMENTS

4.1 Materials

The brushes shall be manufactured from the following materials:

4.1.1 *Bristles*

The bristles used shall be soft, of natural colour, and should be properly selected and straightened. As regards lustre and stiffness, the bristles shall satisfy the requirements specified in **4.6** and **4.7** of this specification.

4.1.2 *Timber*

Any of the timber species listed in Appendix A are recommended. The timber shall be reasonably straight-grained and well seasoned according to CS 159 to a moisture content not exceeding 15 per cent, when tested by the oven dry method (see Appendix B).

The timber shall be free from brashness, any kind of biological or non-biological deteriorations, insect attack, centre-heat (pith), knots, cracks, warp and any other defect which may reduce the life of the brush or affect its utility.

4.1.3 *Ferrule*

Tinplate used for ferrules of different sizes of brushes shall be as specified in Table 1. Sizes of brushes other than that prescribed in Table 1 may be supplied by agreement between the purchaser and the supplier.

TABLE 1

Size of brush mm	Nominal thickness of tinplate mm
12	0.15
18	0.15
25	0.25
37	0.25
50	0.25
62	0.25
75	0.30
100	0.30
125	0.35
150	0.35

4.1.4 *Wedge*

A suitable non-metallic wedge shall be used.

4.1.5 *Pins*

The connecting pins shall be round-headed, steel pins 1.00 mm to 1.40 mm in diameter. The securing pins shall be flat or round-headed, brass or steel pins 1.00 mm to 1.40 mm in diameter. The number of connecting and securing pins used shall be as specified in Table 2.

4.1.6 *Setting media*

Brushes shall be set in vulcanized rubber or resin so as to satisfy the requirements specified in 4.5.1 and 4.5.2.

4.2 Dimensions and tolerances

4.2.1 *Dimensions*

The brushes shall conform to the dimensions as given in Table 2.

4.2.2 *Tolerances*

The tolerances on the linear dimension shall be as follows:

Nominal size (mm)	Tolerance (mm)
Up to 15	± 1.0
Over 15 but below 40	± 2.0
40 and above	± 3.0

4.3 Manufacture

The brushes shall generally conform to the shape and design as shown in the figure.

4.3.1 The ferrule shall be lapped and soldered or spot welded. Alternatively, it may be hook jointed. The ferrule, if lapped, shall be properly soldered. The lapping shall be not less than 3 mm. The ferrule shall be grooved, and shall be coated with a suitable varnish.

4.3.2 The bristles with wedge shall be properly set with the setting media in the ferrule. There shall be no loose bristles and the setting media shall not flow out of the ferrule.

TABLE 2 - Table of reinforcements for paint, varnish and flat distemper brushes

(See Figure)

Serial No.	Size	Bristle		Handle		Ferrule			No. of connecting pins	No. of securing pins	Mass of bristle (min) (g)
	Breadth under ferrule	Protrusion (min) A	Overall length (min) B	Overall length C	Thickness (min) E	Length (min) F	Internal width G	Internal thickness H	J	K	
(1)	(2) mm	(3) mm	(4) mm	(5) mm	(6) mm	(7) mm	(8) mm	(9) mm	(10)	(11)	(12)
1.	12	38	45	125	10	30	12	9	1	2	3
2.	18	38	45	125	10	30	18	9	2	3	4
3.	25	38	45	145	12	30	25	12	2	3	5
4.	37	40	48	145	12	30	37	12	3	4	9
5.	50	42	50	145	15	30	50	16	3	4	14
6.	62	46	55	150	15	30	62	16	4	4	16
7.	75	50	60	150	15	30	75	16	5	5	19
Flat distemper brushes											
8.	100	57	65	175	20	27	100	19	6	6	29
9.	125	57	65	175	20	27	125	20	7	9	35
10.	150	57	65	175	20	27	150	20	8	10	42

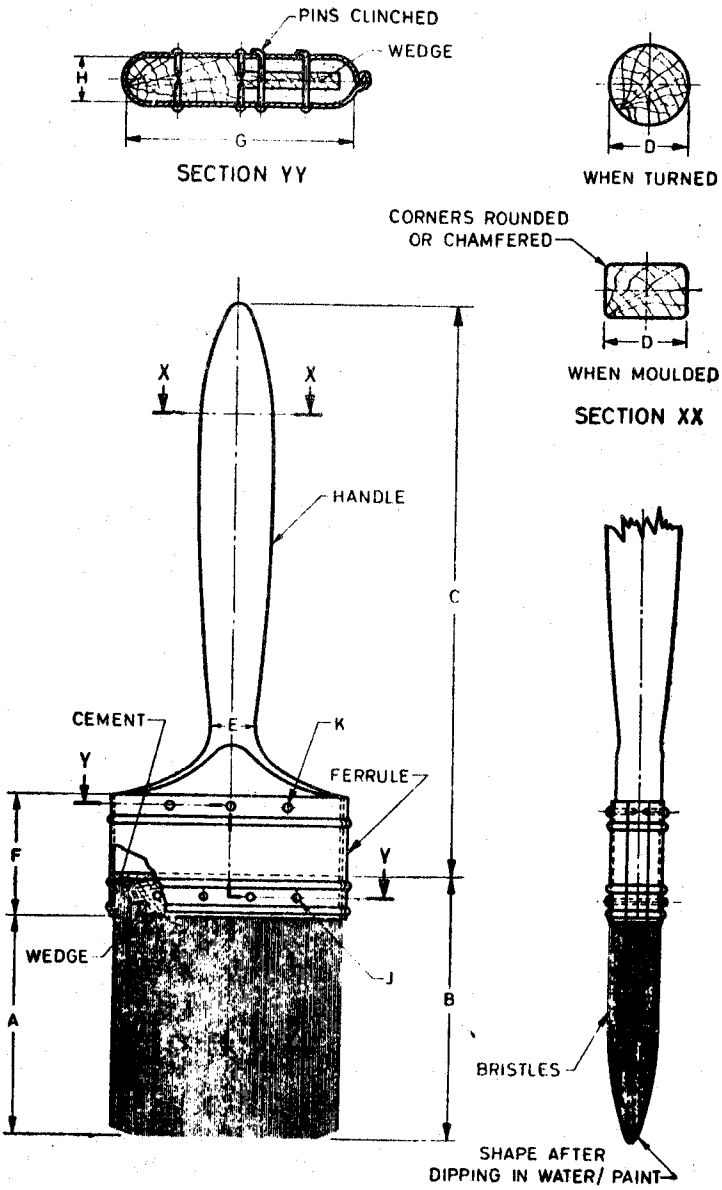

FIG. 1 SHAPE AND DESIGN OF BRUSHES, PAINTS AND VARNISHES, FLAT

4.3.3 In the case of flat brushes, the handle shall be inserted into the ferrule and secured by means of requisite number of securing pins and these shall be driven into the ferrule alternatively from opposite sides.

4.3.4 In the case of flat brushes only, the connecting pins if used shall be properly inserted and neatly clinched on the opposite sides of the ferrule or riveted. The clinching shall be not less than 3 mm or not more than 5 mm.

4.4 Workmanship and finish

4.4.1 The handle shall be finished smooth all over and shall be properly varnished or lacquered.

4.4.2 The ferrule shall be free from sharp edges.

4.5 Serviceability

4.5.1 When used as a brush after immersing in acetone for 48 hours as prescribed in **8.1** the bristles shall show no sign of loosening.

4.5.2 There shall be no appreciable creeping of the cement when tested in an oven as prescribed in **8.2**.

4.6 Fading of bristles

The bristles shall not show any fading when tested as prescribed in **8.3**.

4.7 Processing of bristles

The processing of bristles shall be considered as satisfactory if not less than 85 per cent of the bristles by mass are of categories (a) and (b) as prescribed in C.4 and out of these 60 per cent shall belong to category (a).

4.8 Mass of bristles per finished brush

The mass of bristles shall be as specified in Table 2 when determined by the method prescribed in Appendix D. A tolerance of ± 5 per cent shall be allowed in the mass of the filling material provided the average mass of the filling material per brush in any lot is not below that specified. The average mass of filling material per brush in a lot shall be assessed by taking the average mass of the filling material of 3 brushes in lots not exceeding 300 brushes and of 6 brushes in lots exceeding 300 brushes.

5 MARKING

Unless otherwise agreed to between the indentor or inspection authority and the supplier, each brush shall be legibly and indelibly marked or stamped with the manufacurer's name or recognised trade mark, the warranty of the bristles (stating pure bristles) and the size of the brush.

6 PRESERVATION

The bristles of the brushes shall be liberally dusted, before packing, with a mixture of 5 parts of acceptable insecticide and 95 per cent by mass of french chalk.

7 PACKING

7.1 The bristle portion of the brush along with the ferrule shall be neatly covered with polyethylene or cellulose film and suitably secured.

8 METHOD OF TEST

8.1 Detection of setting media

The brushes shall be suspended in acetone for 48 hours with the bristles and one quarter of the ferrule immersed. On completion of this test the brushes shall not develop any softening or other defects in the setting and the bristles shall show no sign of lossening when used as a brush without paint on a plane surface.

8.2 Oven test

8.2.1 *For non-rubber set brushes*

The brush without handle when suspended in an oven with the protruding bristle end upward and subjected to a temperature of 60 $\pm$ 2 ^{o}C for 4 hours, shall show no appreciable creeping of the cement.

8.2.2 *For rubber set brushes*

The brush without handle when suspended in an oven with the protruding bristle end upward and subjected to a temperature of 132 $\pm$ 2 ^{o}C for 2 hours, shall show no appreciable creeping of the cement.

8.3 Detection of dyed bristle

8.3.1 *Immersion in water*

Immerse the bristle portion of the brush for 6 hours in distilled water maintained at a temperature of 70 ± 5 °C, in such a way that the metal ferrule does not touch water and the bristles do not touch the bottom of the container. On completion of this test, the water shall not show black or blue colour and the colour of the bristle shall not fade.

8.3.2 *Immersion in xylene*

Immerse the bristle portion of the brush for 2 hours in xylene maintained at room temperature in such a way that the metal ferrule does not touch the xylene and the bristles do not touch the bottom of the container. On completion of this test, the xylene shall not show black, blue or violet colour and the colour of the bristles shall not fade.

9 SAMPLING AND CRITERIA FOR CONFORMITY

9.1 Method of sampling

9.1.1 *Lot*

In any consignment all the brushes of the same size and type shall be divided into groups of 1000 brushes or less and each such group shall constitute a lot. Care shall be taken to ensure that brushes included in a lot do not differ in construction as far as possible.

9.1.2 The conformity of the brushes in a lot to the requirements of this specification shall be ascertained for each lot separately.

9.1.3 The number of brushes to be selected for sampling shall be in accordance with the following table.

Table 3 - Scale of sampling

Number of brushes in the lot 1	Number of brushes to be selected 2	Acceptance number 3	Sub-sample size 4
Up to 150	8	0	2
151 to 300	12	0	2
301 to 500	16	1	3
501 to 1000	20	1	3

9.1.4 Brushes shall be selected at random. In order to ensure randomness of selection a random number table as described in SLS 428 shall be used.

9.2 Number of tests

9.2.1 All the brushes in the sample shall first be visually examined for the relevant requirements.

9.2.2 4 Sub samples of the size given in Column 4 of the Table 3 shall then be randomly selected from the above sample and subjected to the following tests or series of tests.

Sub sample 1 - Test given in 4.5.1

Sub sample 2 - Test given in 4.5.2

Sub sample 3 - Test given in 4.6

Sub sample 4 - Tests given in 4.7 and 4.8

9.3 Criteria for conformity

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

9.3.1 The number of brushes fails to satisfy any one or more requirements given in 4 and 5, for which it is inspected visually is less than or equal to the corresponding acceptance number given in Column 3 of Table 3.

9.3.2 All the brushes in each sub sample satisfies the relevant requirements.

APPENDIX A

RECOMMENDED SPECIES OF TIMBER FOR THE MANUFACTURE OF HANDLES FOR BRUSHES

1.	*Buruta* (Satinwood)	*Chloroxylon swietenia* DC
2.	*Dawata*	*Carallia brachiata* (Lour.) Merr.
3.	*Ehela*	*Cassia fistula L.*
4.	*Ginisapu*	*Michelia champaca L.*
5.	*Godakirilla*	*Holoptolea integrifolia* (Roxb.) Planch
6.	*Gurukina*	*Calophyllum calaba L.*
7.	*Halmilla*	*Berrya cordifolia* (Willd.) & Burret.
8.	*Havarinuga (Alstonia)*	*Alstonia macrophylla* (Wall. ex G. Don.)
9.	*Helamba*	*Mitragyna parvifolia* (Roxb.) Korth.
10.	*Hik*	*Lannea coramandelioa* (Houtt.) merr.
11.	*Kahata*	*Careya arborea* Roxb.
12.	*Kaluwara (Ebony)*	*Diospyres ebenum* Koenig.
13.	*Kolon*	*Adina cordifolia* (Roxb.) Brandis

14.	*Kos* (Jak)	*Artocarpus heterophyllus* Lam.
15.	*Kumbuk*	*Terminalia arjuna* (Roxb.) Wight & Arn.
16.	*Mahogany* (Broad-leaved)	*Swietenia macrophylla* King
17.	*Mahogany* (Narrow-leaved)	*Swietenia mahogani* Jacq.
18.	*Neralu*	*Elaeodendron glaucum* (Rottb.) Pers.
19.	*Palu*	*Manilkara hexandra* (Roxb.) Dubard
20.	*Panakka*	*Pluerostylia opposita* (Wall.) Alston
21.	*Pihimbiya*	*Filicium decipiens* (Wight & Arn.) Thw.
22.	*Suriyamara*	*Albizia odoratissima* (L.f.) Benth.
23.	*Thekka* (Teak)	*Tectona grandis* L.f.
24.	Toona	Cedrella toona Roxb.
25.	*Ubberiya*	*Carallia calycina* Benth.
26.	*Welang*	*Pterospermum canescens* Roxb.

APPENDIX B

DETERMINATION OF MOISTURE CONTENT FOR TIMBER USED IN BRUSHES

B.1 TEST SPECIMEN

The entire block used in brushes may form the test specimen for determination of moisture content or a section cut from the test specimen may as well be used for moisture content determination. When for any reason additional determination of moisture content is required, separate samples shall be prepared from the sample material as is used in preparing the test specimens. Smaller specimens may be used when deemed necessary. The test shall be carried out immediately after cutting the specimen.

B.2 PROCEDURE

Weigh accurately each test specimen. This specimen shall then be dried in a ventilated oven at a temperature of 105 $\pm$ 2 ^{o}C until the mass becomes constant between 2 successive weighings made at an interval of not less than one hour.

B.3 CALCULATION

The moisture content, expressed as a percentage of the oven-dry mass, is given by the formula,

$$\text{Moisture content} = \frac{m_1 - m_o}{m_o} \times 100$$

Where,

m_1 = Initial mass in gram of the test specimen.

m_o = Oven-dry mass in gram of the test specimen.

APPENDIX C

METHOD FOR THE DETERMINATION OF PROCESSING CURVING OF BRISTLES

C.1 GENERAL

The object of this test is to determine whether the processing of the bristles, for the elimination of their natural tendency to curve, has been adequate or not.

C.2 TEST SAMPLE

A bunch of bristles, freed from the setting media by gentle hammering or by soaking in a solvent and consisting of at least 50 per cent of the total mass of the bristles of the brush shall constitute the test sample.

C.3 PROCEDURE

Tie the test sample loosely with thread or linen tape at one end and suspend into water maintained at 70 ± 2 °C for 10 minutes. Remove the bristles from the water and shake to remove as much water as possible. Untie the knot and spread out all the bristles on a large sheet of blotting and allow to dry under standard conditions (27 ± 2 °C and a relative humidity of 65 ± 5%) for 48 hours.

C.4 The bristles shall then be measured and categorized as below:

a) Bristles which are straight.

b) Bristles which have a curvature whose radius is 230-mm or more.

c) The remainder.

C.5 CRITERIA FOR CONFORMITY

For declaring the conformity of processing of the bristles, the bristles selected according to C.2 shall satisfy the requirements prescribed in 4.7.

APPENDIX D

METHOD FOR DETERMINATION OF MASS OF BRISTLES

D.1 GENERAL

For determining the mass of bristles in a brush, the bristles are detached by gentle hammering, as described in D.2 or by soaking in a solvent as described in D.3.

D.2 PROCEDURE OF GENTLE HAMMERING

Remove all connecting pins as well as those securing the handle. Cut the ferrule right through its length on any one of the sides by means of a chisel. Open the ferrule and take out the bristles. Hammer the root ends of the bristles gently with a raw hide mallet to reduce the setting media to powder and shake the bristle. Repeat this process till all traces of the setting media are removed and then weigh the bristles.

D.3 PROCEDURE OF SOAKING IN A SOLVENT

Open the ferrule and take out the bristles. Soak the setting in an appropriate solvent until it is sufficiently friable to be broken down. This should normally take 12 to 18 hours. Remove the bristles from the solvent mixture and gently knead down between the fingers so as to separate the bristles from the block into which they are mounted, but taking care that no undue force is used which may break the bristles. Repeat this process until the bristles are free from their sotting media. Dry in an oven at 100 $\pm$ 2 ^{o}C. Cool and weigh under prevalent atmospheric conditions.

NOTE - Trichloroethylene or dichloromethane is suitable for rubber or pitch settings and acetone for synthetic resin settings.

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