SRI LANKA STANDARD 627:1983
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SPECIFICATION FOR
GAS MANTLES

BUREAU OF CEYLON STANDARDS

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SLS 627:1983

Gr. 5

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SRI LANKA STANDARD

SPECIFICATION FOR GAS MANTLES

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Bureau of Ceylon Standards on 1983-12-20, after the draft, finalized by the Drafting Committee on Gas Mantles had been approved by the Textiles Divisional Committee.

All standard values 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 Indian Standards Institution is gratefully acknowledged.

1 SCOPE

1.1 This specification covers the requirements and methods of sampling and tests for gas mantles for oil pressure lanterns.

1.2 This does not cover hard mantles for low pressure gas lanterns.

2 REFERENCES

IS 1384 Oil pressure lanterns

CS 102 Presentation of numerical values

SLS 428 Random sampling methods.

3 DEFINITIONS

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

3.1 candela (cd) : The luminous intensity, in a given direction of a source that emits monochromatic radiation of frequency 540 x 10^{12} hertz and of which the radiant intensity in that direction is 1/683 watt per steradian.

3.2 mean horizontal candle power : Average of all the intensities in candelas measured in a horizontal plane passing through the centre of the luminous mantle.

4 REQUIREMENTS

4.1 Materials

The hose for the mantle shall be manufactured from art-silk, cotton, viscose rayon or any other suitable material.

4.2 Manufacture

The mantles shall be symmetrical and of such dimensions as to satisfy the requirements given in Table 1. The mantles shall be suitably tied at the closed end and shall be provided with a thread for attachment to the nozzle, the thread being such that it retains the mantle on the nozzle even after burning. The mantle shall be treated with suitable chemicals to give the rated luminous intensity.

TABLE 1 - Dimensions of mantle

Rated luminous intensity (cd) (1)	Diameter of the mantle in finished ironed condition mm, min. (2)	Diameter of the burnt mantle skeleton mm, min. (3)	Length of the burnt mantle skeleton mm, min. (4)
100	80	28	40
200	88	30	42
300	94	32	47
350	95	33	50
400	96	34	52

4.3 Life

The mantles shall have a minimum life of 50 hours and an average life of 60 hours measured on six samples when tested in accordance with 7.1.

4.4 Luminous intensity

The mantles shall have a minimum luminous intensity corresponding to its rated value (see Table 1) when tested in accordance with 7.2.

4.5 Lighting efficiency

The mantles shall have a lighting efficiency of not less than two, when calculated according to the following formula:

$$\text{Lighting efficiency} = \frac{\text{Mean horizontal luminous intensity}}{\text{Mass in grams of fuel consumed per hour}}$$

4.6 Capacity to withstand shock

The mantles shall be capable of withstanding the shock test prescribed in 7.3.

5 PACKAGING AND MARKING

5.1 Packaging

5.1.1 Each mantle shall be packed in a moisture-proof envelope.

5.1.2 Ten such mantles shall be contained in suitable packets.

5.2 Marking

5.2.1 Each envelope containing a mantle shall be marked legibly and indelibly with the following information:

a) Name and address of manufacturer;

b) Registered trade mark, if any;

c) Rated luminous intensity in candela; and

d) Batch or code number.

5.2.2 The envelope may also be marked with *Instructions for use*.

5.2.3 The packets containing the mantles shall be marked legibly and indelibly with the following information:

a) Name and address of manufacturer;

b) Registered trade mark, if any;

c) Rated luminous intensity in candela;

d) Batch or code number; and

e) Number of mantles.

6 SAMPLING

6.1 Definitions

6.1.1 *Lot*

In a single consignment, mantles or the same rating and belonging to the same batch of manufacture shall constitute a lot.

6.2 Scale of sampling

6.2.1 A sample shall be taken from each lot for ascertaining its conformity to the requirements of this specification.

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

TABLE 2 - Scale of sampling

No. of mantles in a lot (1)	No. of mantles to be selected (2)
Up to 150	12
151 to 500	14
501 to 1 000	16
1 001 and above	22

6.2.3 These mantles shall be drawn from the packets. For this purpose at least 10 per cent of the packets, subject to a minimum of 5 packets, shall be drawn from the lot and an equal number of mantles, as far as possible, shall be drawn from each packet selected.

6.2.4 Packets and mantles shall be drawn at random. To ensure randomness of selection, a random number table given in SLS 428 shall be used.

6.2.5 The mantles shall not be removed from the envelopes until testing commences.

6.3 Number of tests

6.3.1 All the mantles (in envelopes) in the test sample obtained as in 6.2 shall be inspected for packaging and marking.

6.3.2 A sub-sample of size six shall be drawn randomly and shall be tested for requirement 4.3.

6.3.3 Remaining mantles of the sample shall be divided into two equal sub-samples and shall be subjected to the following tests.

6.3.3.1 Sub-sample 1 shall be tested for,

a) visually inspected for manufacture,

b) diameter of mantles,

c) luminous intensity,

d) lighting efficiency,

e) diameter of the burnt mantle skeleton, and

f) length of the burnt mantle skeleton.

6.3.3.2 Sub-sample 2 shall be tested for capacity to withstand shock.

7 METHODS OF TEST

7.1 Life test

The mantle shall be fitted to a standard lamp (refer IS 1384) corresponding to the rated luminous intensity and shall be burnt continuously with minimum interruptions only for filling the oil tank of the lamp. The mantle shall not be subjected to any vibration or shock.

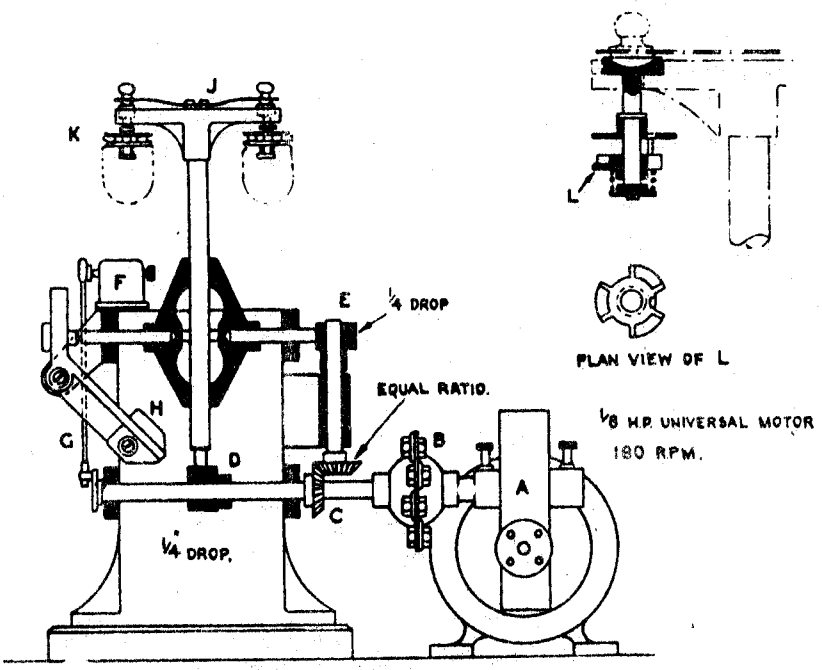
7.2 Luminous intensity test

7.2.1 The mantle shall be fitted to a standard lamp (refer IS 1384) of equivalent rated luminous intensity and tested in accordance with Appendix A.

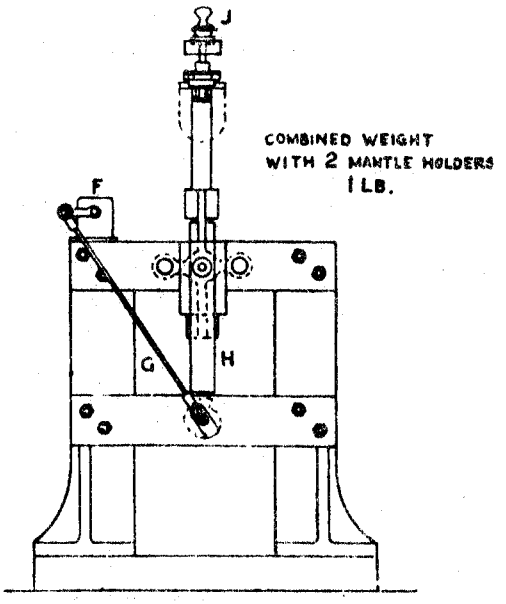
7.2.2 The luminous intensity shall not decrease by more than five per cent after the mantle has been burnt for 45 hours.

7.3 Shock test

The mantles shall be burnt for a continuous minimum period of two hours. They shall be subjected to the shock test on a testing machine, a typical design of which is shown in Fig. 1. The horizontal and vertical movement may be 6.0 ± 1.0 mm to be controlled by cams. The mantles shall withstand a minimum of 150 shocks per minute. Should more than 20 per cent of the mantles subjected to this test fail to withstand 300 shocks, the mantles shall be deemed to have failed to satisfy the requirements of this specification.

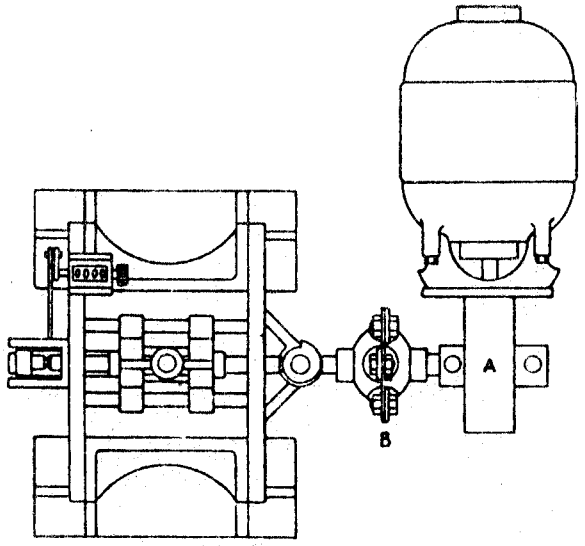


(a) Front Elevation.

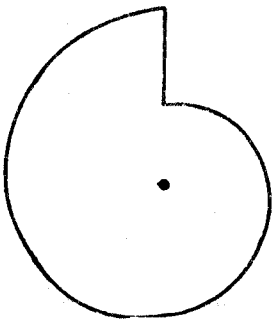


(b) End Elevation.

A = Motor with reduction gear to 180 R.P.M. (approx.).
B = Flexible coupling.
C = Bevel gear to cam driving horizontal movement.
D = Cam to vertical movement, ½ in. drop.
E = Cam to horizontal movement, ¼ in. interior.
F = Counter.
G = Counter drive.
H = Weighted lever controlling horizontal shock.
J = Mantle holder support.
K = Mantle holder.
L = Guide rods for horizontal movement.
M = Cam for vertical movement.



(c) Plan.



M - Cam for vertical movement

FIGURE 1 - Shock testing machine

8 CONFORMITY TO STANDARD

The lot shall be considered as conforming with the requirements of this specification, if the following conditions are satisfied.

8.1 All the mantles (in envelope) satisfy the packaging and marking requirements.

8.2 The six mantles tested for requirements as in 6.3.2 satisfy the requirements for life.

8.3 Each mantle of the sub-samples tested as in 6.3.3 satisfies the relevant requirements.

APPENDIX A

MEASUREMENT OF MEAN HORIZONTAL LUMINOUS INTENSITY

A.1 PHOTOMETRIC EQUIPMENT

The mean horizontal luminous intensity of the lantern shall be measured against a metal filament standard electric lamp, mounted on a standard photometer bench, with a suitable form of photometer head.

A.2 PROCEDURE FOR MEASUREMENT

A.2.1 The fuel container of the lantern shall contain approximately 75 per cent of the amount of kerosine held when full, and the glass globe of the lantern shall be cleaned before the commencement of the test.

A.2.2 The lantern shall be lit and allowed to burn at the working pressure of 0.2 MPa for at least half-an-hour to attain a steady condition.

A.2.3 The lantern shall be mounted on a table fixed on one of the carriages of the photometer bench. The middle portion of the flame, photometer head, and the standard electric lamp, shall be in the same horizontal plane and the photometer head shall be placed perpendicular to the incident light from the flame head. The standard lamp and the photometer head shall be kept fixed at any convenient position on the bench.

A.2.4 The lantern shall be moved to and fro on one side of the photometer head, until the position of balance is found. Measurement shall be made in a horizontal plane by changing the position of lantern in four directions, at right angle to the axis of the appliance, differing by 90°. A number of readings in each direction shall be taken and the average of all these measurements in the four directions shall be taken as the final value.

A.2.5 The temperature and the relative humidity of the test room shall be reported along with the tests.

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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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