SRI LANKA STANDARD 1063 : 1995

UDC 621 . 643.2 : 678.063

SPECIFICATION FOR RUBBER HOSES FOR GENERAL PURPOSES

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard

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SLS 1063 : 1995

Gr. 5

SRI LANKA STANDARDS INSTITUTION
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Sri Lanka

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This standard does not purport to include all the necessary provisions of a contract.

Sri Lanka Standard
SPECIFICATION FOR RUBBER HOSES FOR GENERAL PURPOSES

FOREWORD

This standard was finalized by the Sectoral Committee on Polymers and Polymer Products and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 1995-07-20.

This specification covers low pressure type rubber hoses generally known as garden hoses, the widely used type in Sri Lanka. It maintains a maximum pressure of 0.7 MPa at 40 °C.

Provision is made to enable the colour and the length of the hoses to be as agreed to between the manufacturer and the purchaser.

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.

Guidelines for the determination of a compliance of a lot with the requirements of this standard based on statistical sampling and inspection are given in Appendix A.

In the preparation of this standard, the assistance derived from the following publications is gratefully acknowledged:

i) ASTM D 1566 : 1991 - Standard terminology relating to rubber
ii) ASTM D 3901 : 1990 - Standard consumer product specification for garden hose
iii) ISO 1403 : 1986 - Rubber hoses for water, general purpose

1 SCOPE

This specification prescribes the requirements, and test for rubber hoses used for general purposes.

2 REFERENCES

CS 102 Presentation of numerical values.
SLS 297 Methods of testing vulcanized rubber
Part 2 : Tensile stress - strain properties.
Part 4 : Hardness.
SLS 428 Random sampling methods.

3 DEFINITIONS

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

3.1 blister : A cavity or sac that deforms the surface of a material.

3.2 bloom : A liquid or solid material that has migrated to the surface of a rubber.

3.3 cracks : Fissures, originating in the surface of a rubber vulcanisate, resulting from cyclic deformation (usually bending).

4 MANUFACTURE

Rubber hoses shall be made from natural rubber with the addition of other suitable compounding ingredients and shall be vulcanized. It shall be free from blisters, cracks, embedded foreign matter or any other surface defects such as surface bloom which affects its appearance or impair its serviceability.

NOTE

The colour of the rubber hose should be as agreed to between the purchaser and the supplier. There should be no colour migration to the contact surface while the product in use.

5 DIMENSIONS

5.1 Internal diameter

The rubber hoses shall have the following internal diameters with the tolerances given therein, when measured as described in Appendix B.

Internal diameter, mm	Tolerance, mm
12.5 20	± 0.8
25 50	± 1.6

5.2 Length

The rubber hoses shall have a length of 30 m or as otherwise agreed to between the purchaser and the supplier. No negative tolerance shall be allowed on the declared length when measured as described in Appendix B.

6 REQUIREMENTS

6.1 Physical properties of the rubber compound

6.1.1 Physical properties of the rubber compound shall comply with the requirements given in Table 1 when tested in accordance with the methods given in Column 5 of the table.

NOTE

The physical properties should be tested only when required by the purchaser.

6.1.2 Test pieces required for determination of characteristics given in Table 1 shall be prepared from a sample drawn from the same batch of rubber compound used for moulding of rubber hoses and vulcanized under identical conditions as the rubber hoses supplied by the manufacturer (see A.2.4).

TABLE 1 - Requirements for the rubber compound

Sl. No. (1)	Characteristic (2)	Requirement: Before ageing (3)	Requirement: Change after ageing (at 70 °C for 166 h) (4)	Method of test Reference to SLS 297 (5)
(i)	Tensile Strength, MPa, min.	10	± 10 per cent	Part 2
(ii)	Elongation at break, per cent min.	300	+ 10 per cent - 30 per cent	Part 2
(iii)	Hardness, IRHD	75	+ 5	Part 4

6.2 Burst strength (Hose assembly integrity)

The rubber hose assembly shall show no leak or rupture when tested as in Appendix C.

6.3 Ageing test

The rubber hose shall show no cracks or disintegration externally when tested as in Appendix D.

7 PACKAGING AND MARKING

7.1 Packaging

Rubber hoses shall be packed using polyethylene films or any other suitable material.

7.2 Marking

Each package shall be legibly or indelibly marked or labelled with the following :

a) Name and address of the manufacturer including the country of origin;
b) Trade name;
c) Batch or code number;
d) Dimensions (length and inside diameter); and
e) Year of manufacture.

NOTE

Attention is drawn to the certification marking facilities offered by the Sri Lanka Standards Insitution. See the inside back cover of this standard.

8 METHODS OF TEST

Tests shall be carried out in accordance with the methods given in SLS 297 : parts 2 and 4 and Appendices B to D of this specification.

APPENDIX A
COMPLIANCE OF A LOT

The sampling scheme given in this Appendix should be applied where compliance of a lot to the requirements of this standard is to be assessed based on statistical sampling and inspection.

Where compliance with this standard is to be assured based on manufacturer's control systems coupled with type testing and check tests or any other procedure, appropriate scheme of sampling and inspection should be adopted.

A.1 LOT

In any consignment all rubber hoses of same dimensions belonging to one batch of supply or manufacture shall constitute a lot.

A.2 SCALE OF SAMPLING

A.2.1 Samples shall be tested from each lot for ascertaining its conformity to the requirements of this specification.

A.2.2 The number of rubber hoses to be selected from a lot shall be in accordance with Table 2.

TABLE 2 - Scale of sampling

Number of rubber hoses in the lot (1)	Number of rubber hoses to be selected (2)
Up to 50	4
51 to 90	5
91 to 150	7
151 and above	10

A.2.3 The rubber hoses shall be selected at random. In order to ensure randomness of selection random numbers as given in SLS 428 shall be used.

A.2.4 In order to test for phsycial requirements (see Note), moulded test sheet of the same composition and vulcanized under the same condition as the rubber hoses of the lot shall be provided by the manufacturer with the lot.

NOTE

This parameter should be tested only when required by the purchaser.

A.3 NUMBER OF TESTS

A.3.1 Each rubber hose selected as in A.2.2 shall be inspected for marking, workmanship and colour.

A.3.2 Each rubber hose selected as in A.2.2 shall be measured for length.

A.3.3 Each rubber hose measured as in A.3.2 shall be measured for internal diameter.

A.3.4 Take two rubber hoses selected as in A.2.2, one hose shall be tested for burst strength, the other hose shall be tested for ageing.

A.3.5 If requested, by the producer moulded test sheet obtained as in A.2.4 shall be tested for physical requirmenets.

A.4 CRITERIA FOR CONFORMITY

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

A.4.1 Each rubber hose inspected as in A.3.1 satisfies the relevant requirements.

A.4.2 The value of the expression $\bar{x} - 1.1s$ calculated using the test results on measurement of length is not less than the specified value.

A.4.3 The values of the expressions $\bar{x} - 1.1s$ and $\bar{x} + 1.1s$ calculated using the test results on measurement of internal diameter lie between the specified values.

A.4.4 Each rubber hose tested as in A.3.4 and A.3.5 satisfies the relevant requirements.

A.4.5 The moulded test sheet as tested in A.3.5 satisfy the relevant requirements.

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.

APPENDIX B
MEASUREMENT OF DIMENSIONS

B.1 INTERNAL DIAMETER

Measure the internal diameter at four equally spaced points around the circumference using a vernier caliper and calculate the average.

B.2 LENGTH

Measure the length of the hose between the inside edges of the couplings with the hose laying on a flat surface, free of tension, with all twists removed, using a calibrated measuring device.

APPENDIX C
DETERMINATION OF BURST STRENGTH (HOSE ASSEMBLY INTEGRITY)

C.1 APPARATUS

Equipment which permits the application of controlled internal hydraulic pressure to the test specimen which is immersed in a thermostatically controlled water bath.

C.2 PROCEDURE

Condition the hose assembly for 30 minutes in a water bath maintained at 40 ± 2 °C in such a manner that water does not come in contact with the interior of the hose assembly. Close one end of the hose and supply air pressure at such a rate so that 700 kPa is reached within 6 seconds. Maintain at 700 ± 35 kPa for 10 minutes.

APPENDIX D
AGEING TEST

D.1 APPARATUS

D.1.1 Air-oven, thermostatically controlled at 70 ± 2°C.

D.2 PROCEDURE

Wrap the hose a minimum of 180 ° around a mandrel having a diameter 10 times the nominal inside diameter of the hose. Place the specimen in a circulating air oven (D.1.1) at a temperature of 70 ± 2 °C for 70 h. After removal from the oven, allow the hose to cool to room temperature. Remove the hose from the mandrel and open out to a straight length. Examine for cracks and any disintegrations.

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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.*

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Printed at SLSI (Printing Unit)

SRI LANKA STANDARDS INSTITUTION

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