SRI LANKA STANDARD 804 : 1987

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SPECIFICATION FOR

LOW PROTEIN NATURAL RUBBER

SRI LANKA STANDARDS INSTITUTION

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SLS 804:1987

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Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

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

SRI LANKA STANDARD
SPECIFICATION FOR LOW PROTEIN NATURAL RUBBER

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council, of the Sri Lanka Standards Institution on 1987-11-18, after the draft, finalized by the Drafting Committee on Natural Rubber, had been approved by the Chemicals Divisional Committee.

Rubber latex contains, in addition to hydrocarbons, a large number of non-rubber constitutents such as proteins, which affect the properties of natural rubber. The protein content of the latex can be lowered by adding a proteolytic enzyme such as papain. This low protein natural rubber (LPNR) has a low nitrogen and ash content. Further the moisture absorbing power of this product is also very low.

All standard values in this specification are given 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.

1 SCOPE

This specification prescribes the requirements and methods of sampling and test for low protein natural rubber (LPNR).

2 REFERENCES

CS 102 Presentation of numerical values

CS 124 Test sieves

SLS 385 Code of practice for packaging of Standard Lanka Rubber

SLS 428 Random sampling methods

SLS 484 Tests for raw natural rubber

Part 1 Determination of dirt

Part 2 Determination of ash

Part 3 Determination of nitrogen

Part 4 Determination of volatile matter

3 DEFINITIONS

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

3.1 ash : The residue left on ignition of the product at 550 ± 25 °C.

3.2 dirt : Foreign matter in the product which fails to pass through a 45-µm sieve conforming to **CS 124.**

3.3 volatile matter : Essentially the moisture content of the product, but also includes any other matter which the product may contain and which is volatile at 100 ± 5 °C.

4 REQUIREMENTS

The product shall comply with the requirements given in Table 1, when tested in accordance with the relevant method given in Column 4 of the table.

TABLE 1 - Requirements for low protein natural rubber (LPNR)

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Dirt, per cent by mass,max.	0.03	**SLS 484:Part 1**
ii)	Ash, per cent by mass, max.	0.12	**SLS 484:Part 2**
iii)	Nitrogen, per cent by mass, max.	0.10	**SLS 484:Part 3**
iv)	Volatile matter, per cent by mass, max.	0.50	**SLS 484:Part 4**
v)	Acetone extract content, per cent by mass, max.	3.50	Appendix B

5 PACKAGING

The product shall be compressed into thin lace bales or into thick blanket bales or comminuted and compressed into blocks.

5.1 Thin lace bales of mass 50 kg shall be wrapped in the manner specified in **SLS 385** and in kraft paper bags.

5.2 Thick blanket bales of mass 50 kg shall be wrapped in the manner specified in **SLS 385** and in kraft paper bags or in pallets (see Note).

NOTE - The wrapped bales shall be palletized in the manner specified in SLS 385.

5.3 Thick blanket bales of mass 33.3 kg or comminuted rubber pressed into blocks of mass 33.3 kg shall be wrapped and palletized in the manner specified in SLS 385.

6 MARKING

6.1 The bales and pallets shall be marked in the manner specified in **SLS 385.**

6.2 The bales and pallets 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 Standards 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 Certification Mark may be granted to manufacturers or processors may be obtained from the Sri Lanka Standards Institution.

7 SAMPLING

Representative samples of the product for ascertaining conformity to the requirements of this specification shall be drawn as prescribed in Appendix A.

8 METHODS OF TEST

8.1 Tests shall be carried out as specified in the relevant parts of **SLS 484** and Appendix B of this specification.

8.2 During the analysis, unless otherwise stated, reagents of recognized analytical grade and only distilled water or water of equivalent purity shall be used.

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 pallet and bale inspected as in **A.5.1** satisfies packaging and marking requirements.

9.2 The values of the expression $\bar{x} + 1.3s$ (see Notes) calculated using test results on dirt content, ash content, nitrogen, volatile matter and acetone extract content when tested as in A.5.2 are less than the corresponding limits given in Table 1.

NOTES

1 *Mean* $(\bar{x}) = \dfrac{\text{Sum of the observed values}}{\text{Number of values}}$

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

APPENDIX A

SAMPLING

A.1 LOT

In any consignment all the bales of the same size, manufactured under similar conditions and packed in the similar manner shall constitute a lot.

A.2 SCALE OF SAMPLING

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

A.2.2 The number of bales to be selected from each lot shall depend on the size of the lot and shall be in accordance with Column 1 and Column 2 of Table 2.

TABLE 2 - Scale of sampling

Number of bales in the lot (1)	Number of bales to be selected (2)
Up to 50	3
51 to 150	5
151 and above	7

A.2.3 If the bales are palletized, the number of bales in the lot shall be calculated by determining the number of bales in each pallet and the number of bales to be selected shall be in accordance with Column 1 and Column 2 of Table 2.

A.2.4 The bales shall be selected at random. In order to ensure randomness of selection tables of random numbers as given in SLS 428 shall be used.

A.3 PREPARATION OF INDIVIDUAL SAMPLES

A.3.1 A piece of approximately 360 g shall be taken from each bale selected as in A.2.2 by the method given in A.3.2. The piece taken from each bale shall constitute an individual sample representing the bale. Unless the samples are tested immediately, each individual sample shall be inserted in separate polyethylene bags. The bags shall be heat sealed and marked with necessary details of sampling.

A.3.2 The diagonally opposite corners of the selected bale shall be cut (see Figure 1) with a clean knife without the use of lubricants. Each portion so obtained shall be divided into two parts. One part from each portion shall constitute an individual sample (according to Figure 1, A + B shall constitute an individual sample). The other parts shall constitute a reference sample and the reference sample shall be stored in the manner as described in A.3.1.

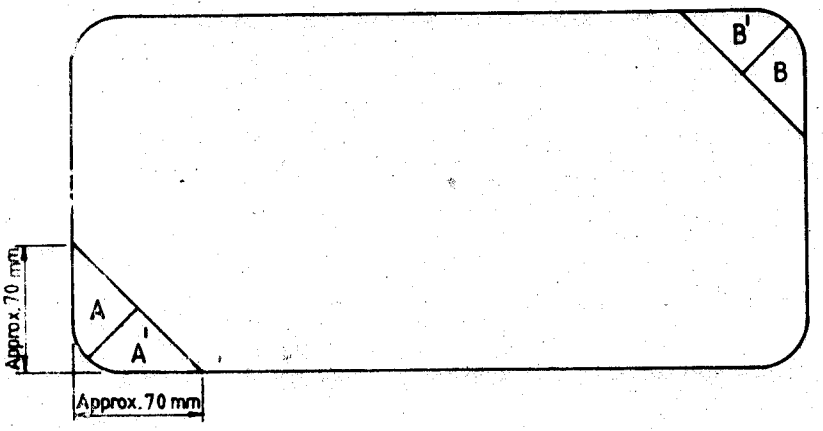

FIGURE 1 - Sketch showing position of cuts of bales

A.4 HOMOGENIZATION/BLENDING OF PIECE(S)

A.4.1 Weigh, to the nearest 0.1 g, a piece from a single bale or several pieces from a sample. Use a laboratory mill with rolls nominally 150 mm in diameter and 300 mm long; the friction ratio shall be 1:1.4 and roll speeds 22 rev/min (front) and 31 rev/min (back). Set the nip of the laboratory mill to 1.30 ± 0.15 mm and the roll temperature to 70 ± 5 °C and homogenize the rubber by passing it 10 times between the rolls. As the rubber passes through the mill, roll it into a cylinder and present it endwise to the mill for the next pass. Collect any solid matter parting from the rubber, re-incorporate it at the next pass. After the last pass do not roll the rubber, remove it as a sheet, allow it to cool, and weigh to the nearest 0.1 g.

A.4.2 Record the mass of the rubber before and after milling since these are required later for the calculation of volatile matter.

A.4.3 Store the rubber in an airtight container unless further testing can be carried out immediately.

A.5 NUMBER OF TESTS

A.5.1 Each pallet and bale selected as in A.2.2 or A.2.3 shall be examined for packaging and marking requirements.

A.5.2 Each individual sample bale obtained as in A.3.1 shall be tested separately for dirt, ash, nitrogen, volatile matter and acetone extract (Table 1) content.

NOTE - Test portions of sufficient mass shall be cut from blended pieces in accordance with the relevant test method.

APPENDIX B

DETERMINATION OF ACETONE EXTRACT CONTENT

B.1 APPARATUS

Extraction apparatus, of Soxhlet type consisting of the following:

a) *Flask*, of 150-ml capacity;

b) *Extraction thimble*; and

c) *Condenser*.

B.2 REAGENT

Redistilled acetone

B.3 PROCEDURE

Pass about 5 g of blended rubber between cold, tightly closed rolls. Allow it to equilibrate at room temperature for half an hour and weigh to the nearest milligram and place it in the extraction thimble.

Weigh the extraction flask. Place the sample in the extraction apparatus and pour about 100 ml acetone (B.2). Subject the sample to at least 80 hot extractions within a period 16 ± 0.5 hours on a water bath maintained at 70 ± 5 °C. Evaporate the solvent. Dry the flask and the residue at 70 ± 5 °C for one hour. Cool and weigh to the nearest milligram.

B.4 CALCULATION

$$\text{Acetone extract, per cent by mass} = \frac{m_2 - m_3}{m_1} \times 100$$

where,

m_1 = mass, in grams, of the test portion;

m_2 = mass, in grams, of the extraction flask and the residue; and

m_3 = mass, in grams, of the empty flask.

SLS CERTIFICATION MARK

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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SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

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.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

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.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

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