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SPECIFICATION FOR
CEYLON CINNAMON
(*FIFTH REVISION*)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
SPECIFICATION FOR CEYLON CINNAMON
(*Fifth Revision*)

SLS 81: 2021

Gr. 8

SRI LANKA STANDARDS INSTITUTION
17, Victoria Place
Elvitigala Mawatha
Colombo 8
Sri Lanka.

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 CEYLON CINNAMON
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FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Food Products and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2021.07.29

Ceylon cinnamon, which is also known as true cinnamon refers to the cultivated specific species of cinnamon indigenous to Sri Lanka (Ceylon). The term "Ceylon" denotes the geographical origin and the term "cinnamon" denotes the specific species of the plant. Ceylon cinnamon (Sinhala: Kurundu, Tamil: Karuwa, English: Ceylon cinnamon, French: Cannelle de Ceylan, German: Ceylon zimt, Japanese: Seiron Nikkei, Spanish: Canelero de Ceilan, Mexican: Canela).

Ceylon cinnamon is produced from the tree *Cinnamomum zeylanicum* Blume. Botanically Ceylon cinnamon plant belongs to the genus *Cinnamomum* of the Lauraceae family. "*zeylanicum*" in the botanical name indicates that the cinnamon tree is indigenous and native to Sri Lanka (Ceylon).

In addition to the cultivated cinnamon types of *Cinnamomum zeylanicum* Blume, there are seven other species of wild cinnamon reported in Sri Lanka.

- *Cinnamomum dubium* Nees
- *Cinnamomum ovalifolium* Wight
- *Cinnamomum litseafolium* Thwaites
- *Cinnamomum citriodorum* Thwaites
- *Cinnamomum rivulorum* Kostermans
- *Cinnamomum sinharajense* Kostermans
- *Cinnamomum capparu- coronde* Blume

Ceylon cinnamon is one of the first spices traded in the ancient world. Originally it was traded overland between its origin and the Arab world and then by ship to Europe after the opening of the sea routes to the Indian Ocean and the Bay of Bengal in the late 15th century.

Sri Lanka was the first country in the world that commenced systematic cultivation of Ceylon cinnamon since ancient times. Ceylon cinnamon from Sri Lanka was introduced by the Dutch and the British colonists to India and other regions, especially the islands of Seychelles and Madagascar. Sri Lanka by far, ranks the largest among the Ceylon cinnamon growing countries in the world and export of cinnamon in the form of quills has been a unique feature.

This Standard was first published in 1973. First revision happened in 1976, by splitting the Standard in to two parts. Part 1 was for the cinnamon quills. Second part which was for cinnamon quillings, featherings and chips was published in 1978 as the second revision. ISO 6539 was adopted as the national standard in 2001 as the third revision. In 2010, the adoption was lifted and the Standard was converted back to Sri Lanka Standard as the fourth revision by merging all cinnamon types. In this fifth revision, ground cinnamon is also included in the scope and definitions are updated. Chemical requirements are revised to meet the required

quality of the product. Microbiological limits, pesticide residue levels and the levels for potentially toxic elements are introduced to safeguard the consumers.

This Standard is subject to the restrictions imposed under the Sri Lanka Food Act No. 26 of 1980 and the regulations framed thereunder.

For the purpose of deciding whether a particular requirement of this Standard 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 **SLS 102**. The number of significant figures to be retained in the rounded off value shall be the same as that of the specified value in this Standard.

In the revision of this Standard, valuable assistance derived from the following publications is gratefully acknowledged.

ISO 6539: 2014 Cinnamon (*Cinnamomum zeylanicum* Blume.) – Specification

1 SCOPE

This Standard prescribes the requirements and methods of sampling and tests for the processed dried bark of Ceylon cinnamon, *Cinnamomum zeylanicum* Blume supplied in the form of quills, cut quills, quillings, featherings, chips, special cuts crushed and powdered cinnamon.

2 REFERENCES

SLS	102	Rules for rounding off numerical values
SLS	124	Test sieves
SLS	143	Code of practice for general principles of food hygiene
SLS	186	Methods of test for spices and condiments Part 1: Preparation of a ground sample for analysis Part 3: Determination of total ash Part 4: Determination of acid insoluble ash Part 5: Determination of moisture content – Entrainment method Part 8: Determination of filth Part 11: Determination of volatile oil content – Hydrodistillation method Part 12: Determination of degree of fineness of grinding – Hand sieving method (Reference method)
SLS	428	Random sampling methods
SLS	516	Methods of test for microbiology of food and animal feeding stuffs Part 5: Horizontal method for the detection of *Salmonella* spp. Part 12: Horizontal method for the detection and enumeration of presumptive *Escherichia coli* (Most Probable Number technique)
SLS	910	Maximum residue limits for pesticides in food
SLS	1332	Methods of test for fruit and vegetable products Part 5: Determination of total Sulphur dioxide content
SLS	1523	Requirements for good agricultural practices Part 3: Cinnamon, Pepper, Coffee
SLS	1562	Good manufacturing practices for Ceylon cinnamon processing Part 1: Cinnamon bark products

Official methods of Analysis, Association of Official Analytical Chemists (AOAC) 20th edition, 2016

3 DEFINITIONS

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

3.1 quills: Scraped peel of the inner bark of mature Ceylon cinnamon stems, first dried under shade to curl and joined together by overlaps and the hollow of which has been filled with small pieces of peeled inner bark of Ceylon cinnamon to form the length of 1050 ± 50 mm (42 ± 2 inches) and thereafter sun drying, if necessary after air curling

3.2 bale: A package of any one particular grade of quills in 1050 ± 50 mm (42 ± 2 inches) length and 25 to 45 kilogram of weight or length/ weight agreed between the supplier and the purchaser, wrapped with suitable material for export

3.3 cut quills: Ceylon cinnamon quills cut to a specific required length

3.4 quillings: Broken pieces of peeled inner bark below 200 mm in length (other than quills cut in specified short length) and splits of peeled inner bark of varying sizes of all grades of cinnamon quills which may include featherings

3.5 featherings: Dried pieces of inner bark obtained by peeling and/ or scraping the bark of Ceylon cinnamon

3.6 chips: Dried bark of unpeelable Ceylon cinnamon stems, branches and trimmings inclusive of the outer bark which has been obtained by chipping or scraping

3.7 ground: Powdered form of peeled dried inner bark of mature Ceylon cinnamon

3.8 crushed: Coarse ground form of peeled dried inner bark of mature Ceylon cinnamon

3.9 special cuts: Cut form of peeled dried inner bark of mature Ceylon cinnamon

3.10 foxing: The occurrence of reddish-brown patches on the surface of the quills, which may become dark brown with time. Foxing can be:

a) superficial patches ("*malkorahedi*"): Appearing on the surface of the quills
b) heavy patches ("*korahedi*"): Resulting in damage to the surface of the quills and making the surface uneven

3.11 foreign and extraneous matter: All materials other than Ceylon cinnamon bark

4 COMMERCIAL GRADES/ TYPES

Commercial grades of Ceylon cinnamon types shall be as follows.

4.1 Quills

Ceylon cinnamon quills are graded on the basis of diameter of quills, number of quills per kilogram, colour and extent of foxing.

Guideline in this respect is given in Appendix **B**.

When quills are packaged in bales, it shall conform to the guideline given in Appendix **C**.

4.2 Cut quills

The cut quills of Ceylon cinnamon are graded on the basis of the length, colour and extent of foxing.

Guideline in this respect is given in Appendix **B**.

4.3 Quillings

Quillings may contain featherings not exceeding 5 per cent by mass.

4.4 Featherings

4.5 Chips

4.6 Ground (powdered)

4.7 Crushed

4.8 Special cuts

5 REQUIREMENTS

5.1 Hygiene

The product shall be cultivated under Good Agricultural Practices (**Part 3** of **SLS 1523**), harvested, processed, packaged, stored and transported under hygienic conditions as prescribed in **SLS 143** and **SLS 1562**.

5.2 Colour

Colour of the product shall be in accordance with the colours given in Appendix **D**.

5.3 Odour and flavour

The product shall have the characteristic odour and mild sweet flavour with hot burning feeling. It shall be free from foreign odours and flavours.

5.4 Mould, insect infestation and animal excreta

The product shall be free from mould growth, living and dead insects, insect fragments and animal excreta visible to the naked eye, or using the required magnifying instruments. If the magnification ×10, this factor shall be mention in the test report.

In case of dispute, contamination in ground cinnamon shall be determined by the method described in **Part 8** of **SLS 186**.

5.5 Foreign and extraneous matter

The product shall be free from foreign and extraneous matter.

5.6 Particle size

5.6.1 *Ground (powdered)*

Ceylon cinnamon shall be sufficiently ground such that 100 per cent of the material shall pass through a sieve of 500 µm aperture size conforming to **SLS 124** and more than 90 per cent of it shall pass through a sieve of 300 µm aperture size conforming to **SLS 124** when determined by the method specified in **Part 12** of **SLS 186**.

5.6.2 *Crushed*

Ceylon cinnamon shall be crushed such that 100 per cent of the material shall pass through a sieve of 1000 µm aperture size conforming to **SLS 124** and more than 90 per cent of the material shall retain on a sieve of 500 µm aperture size conforming to **SLS 124** when determined by the method specified in **Part 12** of **SLS 186**.

5.6.3 *Special cuts*

The particle size of special cuts shall be varying from 1 mm to 5 mm.

5.7 Chemical requirements

The product shall comply with the chemical requirement given in Table **1**, when tested according to the methods given in Column **5** of the table.

TABLE 1 - Chemical requirements for Ceylon cinnamon

Sl No	Characteristic	Requirement		Method of Test
		Quills, Cut quills, Quillings, Featherings, Chips	Ground (powdered), Crushed, Special cuts	
(1)	(2)	(3)	(4)	(5)
i)	Moisture, per cent by mass, max.	14.0	12.0	**SLS 186: Part 5**
ii)	Total ash, per cent by mass, max.	5.0	8.0	**SLS 186: Part 3**
iii)	Acid insoluble ash, per cent by mass, max.	1.0	1.0	**SLS 186: Part 4**
iv)	Volatile oil content, on dry basis, ml/ 100 g, min.	1.0*	0.5	**SLS 186: Part 11**
v)	Sulphur, as SO_2, mg/ kg, max.	150.0	150.0	**SLS 1332: Part 5**

*Minimum volatile oil content on dry basis for chips shall be 0.5 ml/ 100 g.

5.8 Microbiological limits

The product shall comply with the microbiological limits given in Table **2** when tested according to the methods given in Column **4** of the table.

TABLE 2 – Microbiological limits for Ceylon cinnamon

Sl No	Organism	Limit	Method of Test
(1)	(2)	(3)	(4)
i)	*Escherichia coli*, (MPN), per g, max.	Absent	**SLS 516: Part 12**
ii)	*Salmonella* spp, in 25 g	Absent	**SLS 516: Part 5**

NOTE
It is not necessary to carry out this test as a routine for all the samples. This should be tested in case of dispute and when required by the purchaser or vendor or when there is any suspicion of microbial contamination.

6 CONTAMINANTS

6.1 Pesticide residues

The product shall be cultivated and processed with special care under Good Agricultural Practices (**SLS 1523: Pat 3**) and Good Manufacturing Practices (**SLS 143** and **SLS 1562)**, so that residues of those pesticides which may be required in the production do not remain or if

practically unavoidable are reduced to the minimum level to comply with the maximum tolerable limits specified in **SLS 910**.

NOTE
It is not necessary to carry out this determination as a routine for all the samples. This should be tested in case of dispute and when required by the purchaser or vendor or when there is any suspicion of pesticide contamination.

6.2 Potentially toxic elements

The product shall not exceed the limits given in Table **3**, when tested according to the methods given in Column **4** of the table.

TABLE 3 – Limits for potentially toxic elements

Sl No (1)	**Potentially toxic element** (2)	**Limit** (3)	**Method of test** (4)
i)	Arsenic, as As, mg/ kg, max.	0.1	**AOAC 986.15/ AOAC 2013.06**
ii)	Cadmium, as Cd, mg/ kg, max.	0.2	**AOAC 999.11/ AOAC 2013.06**
iii)	Lead, as Pb, mg/ kg, max.	0.2	**AOAC 994.11/ AOAC 2013.06**

7 PACKAGING

7.1 Local market

The product shall be packaged in clean, sound, dry packages, made of food grade packaging material which does not affect the product but protects it from the ingress of moisture or loss of volatile matter.

7.2 Export market

7.2.1 *Quills*

Each grade of quills shall be packaged in the form of compact bales of about 25 kg and/ or 45 kg or as agreed between the supplier and the purchaser. The wrapping used for bales shall be clean, suitable food grade packing material.

7.2.2 *Cut quills*

Cut quills shall be packaged in clean, suitable food grade packaging material according to the requested weight.

7.2.3 *Quillings, featherings and chips*

Quillings, featherings and chips shall be packaged in bags made out of suitable food grade material.

7.2.4 *Ground (powdered), crushed and special cuts*

The product shall be packaged in clean, suitable food grade packing material.

8 MARKING AND/ OR LABELING

8.1 Each package shall be marked and/ or labelled legibly and indelibly or a label shall be attached to the package with the following information, except for packages intended for export where marking and/ or labelling shall be in accordance with **8.2**.

a) Name of the product as "Ceylon cinnamon"
b) Commercial type/ grade of the product as "quills" or "cut quills" or "quillings" or "featherings" or "chips" or "ground/ powdered" or "crushed" or "special cuts";
c) Brand name or trade name, if any;
d) Net weight, in "g" or "kg";
e) The batch or code number or a decipherable code marking;
f) Name and address of the manufacturer and packer or distributor in Sri Lanka;
g) Date of manufacture; and
h) Date of expiry.

8.2 The following information shall be marked and/or labelled on packages intended for export:

a) Name of the product;
b) Commercial type/ grade;
c) Net weight;
d) The words; "Ceylon Cinnamon"
"*Cinnamomum zeylanicum* Blume"
"Product of Sri Lanka"
e) Markings to identify the exporter;
f) Serial number of the package in the consignment;
g) Destination; and
h) Any other information requested by the buyer/ importing country.

9 SAMPLING

Representative samples of Ceylon cinnamon shall be drawn as given in Appendix **A**.

10 METHOD OF TESTS

Tests shall be carried out in accordance with the methods prescribed in **Appendix D** of this Standard, **Parts 3**, **4**, **5**, **8**, **11** and **12** of **SLS 186**, **Parts 5** and **12** of **SLS 516** and Methods of Analysis of the Association of Official Analytical Chemists (**AOAC**), 20th edition, 2016.

11 CRITERIA FOR CONFORMITY

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

11.1 Each package examined as in **A.5.1** satisfies the packaging and marking and/ or labelling requirements.

11.2 Each package inspected as in **A.5.2** satisfies the requirements given in **5.2**, **5.3**, **5.4**, **5.5** and **5.6**.

11.3 The composite sample of Ceylon cinnamon prepared as in **A.5.3** satisfies the requirements given in **5.7** and **6**.

11.4 Each sample tested as in **A.5.4** satisfies the microbiological requirements given in Clause **5.8**.

APPENDIX A
SAMPLING

A.1 CONSIGNMENT

The quantity of cinnamon packages submitted at one time and covered by a particular contract or shipping document.

A.2 LOT

All packages in a single consignment of the cinnamon quills pertaining to the same type/ grade shall constitute a lot.

A.3 GENERAL REQUIREMENTS OF SAMPLING

In drawing, preparing, storing and handling samples, following precautions and directions shall be taken:

A.3.1 Samples shall be drawn in a protected place not exposed to damp air, dust or soot.

A.3.2 The sampling instruments shall be clean and dry when used.

A.3.3 The samples shall be protected against adventitious contamination.

A.3.4 The samples shall be placed in clean and dry containers/ packages. When drawing samples for microbiological examination, the sample containers shall be sterilized.

A.3.5 The sample containers/ packages shall be sealed air-tight after filling and marked with necessary details of sampling.

A.3.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the room temperature.

A.4 SCALE OF SAMPLING

A.4.1 If a consignment is declared or is known to include different types/ grades or if it appears that the lot is heterogeneous, containers/ packages containing same type/ grade of Ceylon cinnamon shall be grouped together and each group thus obtained shall constitute a separate lot.

A.4.2 The conformity of a lot to the requirements of this Standard shall be ascertained on the basis of tests carried out on the samples selected from the lot.

A.4.3 The number of containers/ packages to be selected from a lot shall be in accordance with Table **4**.

TABLE 4 - Scale of sampling

Number of containers/ packages in the lot (1)	**Number of containers/ packages to be selected** (2)
Up to 100	8
101 to 400	14
401 to 1 000	20
1 001 and above	25

A.4.4 The containers/ packages shall be selected at random. In order to ensure randomness of selection, random number tables as given in **SLS 428** shall be used.

A.4.5 Reference sample

If a reference sample is required, the number of containers/ packages to be selected from a lot shall be three times the number given in Column **2** of Table **4**. The containers/ packages so selected shall be divided into three equal parts. One of these parts shall be marked for the purchaser, one for the supplier and the third for referee.

A.4.6 Preparation of composite sample

A.4.6.1 Ground (powdered) Ceylon cinnamon

Equal quantities from selected containers/ packages shall be drawn and thoroughly mixed to form the composite sample.

A.4.6.2 Types other than ground (powdered) Ceylon cinnamon

Equal quantities from each container/ package shall be drawn and thoroughly mixed to form a uniform sample and grind as given in **Part 1** of **SLS 186** to form the composite sample.

A.5 NUMBER OF TESTS

A.5.1 Each container/ package selected as in **A.4.3** shall be examined for packaging and marking and/ or labelling requirements.

A.5.2 The contents of each container/ package selected as in **A.4.3** shall be inspected for requirements given in **5.2**, **5.3**, **5.4**, **5.5** and **5.6**.

A.5.3 The composite sample prepared as in **A.4.6** shall be tested for the requirements given in **5.7** and **6**.

A.5.4 A sub-sample of 5 units shall be drawn from the containers/ packages selected as in **A.4.6** and tested for requirements given in **5.8**.

APPENDIX B
GUIDELINES FOR GRADING OF CINNAMON QUILLS AND CUT QUILLS

B.1 The Ceylon cinnamon quills should be of the following grades:

Continental
Alba
C5 extra special
C5 special
C5
C4
C3

Mexican
M5 special
M5
M4

Hamburg
H1
H2 special
H2
H3

B.2 It is recommended that grading of Ceylon cinnamon is based on the diameter of quills, the number of quills per kilogram and the extent of foxing, be as indicated in Table **5**.

TABLE 5 – Grade designation for Ceylon cinnamon quills and cut quills

Sl No	Grade	Diameter of quills, mm, max.	Number* of whole quills (1050 ± 50 mm), per kg, min.	Extent of foxing, per cent, max.**
(1)	(2)	(3)	(4)	(5)
i)	Alba	6	45	10
ii)	C5 (extra special)	8	33	10
iii)	C5 (special)	10	30	10

TABLE 5 Continued…

iv)	C5	12	27	5
v)	C4	16	22	15
vi)	C3	18	20	20
vii)	M5 (special)	16	22	60
viii)	M5	18	20	60
ix)	M4	21	15	60
x)	H1	23	10	25
xi)	H2 (special)	25	9	40
xii)	H2	32	7	55
xiii)	H3	38	6	65

***** *Number of quills per kilogram may vary depending on the length of the quill.*
****** *The extent of foxing is determined by visual examination.*

APPENDIX C
GUIDELINE FOR CONSTITUTION OF A BALE

C.1 The minimum permissible length of quills in a bale for each grade of quills should be as follows:

Alba
C5 (extra special), C5 (special), C5, C4, C3 } 200 mm
M5 (special), M5, M4

H1, H2 (special), H2, H3 - 150 mm

C.2 Due to unavoidable breakages in handling and transport the permissible quantity of pieces of quills (less than 200 mm* in length) of the same grade and splits should be as given in Table **6**.

TABLE 6 – Permissible quantity of pieces of quills and splits of the same grade in bales of quills

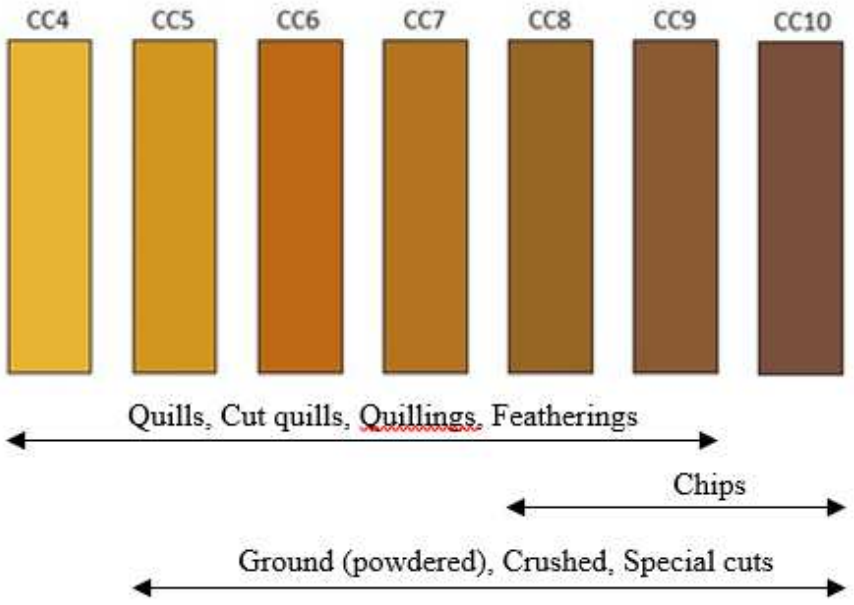
Sl No	**Grade**	**Pieces of quills and splits per bale, per cent by mass, max.**
(1)	(2)	(3)
i)	Alba and all Continental grades	1
ii)	All Mexican grades	2
iii)	All Hamburg grades	3

C.3 The interior of a bale may contain quills of length between 200 mm* and 1000 mm (referred to as short quills) up to a maximum of 40 per cent by mass. However, quills having a length less than 600 mm should be not more than 15 per cent by mass.

* 150 mm for Hamburg grades.

APPENDIX D
COLOUR REFERENCE FOR CEYLON CINNAMON BARK PRODUCTS

D.1 PANTON COLOUR REFERENCE



D.2 PANTHON COLOUR CODE

D.3 Colour examination shall be carried out under day light (bright sunlight) or using colour box with D65 lighting.

ANNEX
(informative)

RECOMMENDATIONS RELATING TO STORAGE AND TRANSPORT CONDITIONS

* The containers/ packages of cinnamon should be stored in covered premises, well protected from the sun, rain and excessive heat.

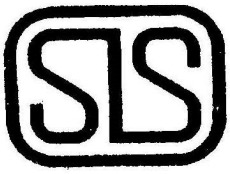
* The store room should be dry, free from objectionable odours and proofed against entry of insects and vermin. The ventilation should be controlled so as to give good ventilation under dry conditions and to be fully closed under damp conditions. In a storage warehouse, suitable facilities should be available for fumigation.

* The containers should be so handled and transported that they are protected from the rain, from the sun or other sources of excessive heat, from objectionable odours and from cross-infestation, especially in the holds of ships.

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

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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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