

SRI LANKA STANDARDS 613: 2017
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SPECIFICATION FOR
TURMERIC, WHOLE AND GROUND
(First Revision)

SRI LANKA STANDARDS INSTITUTION

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SLS 613: 2017

Gr. 6

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Sri Lanka Standard
SPECIFICATION FOR TURMERIC, WHOLE AND GROUND
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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 2017-07-21.

This Standard was first published in 1983. In this first revision, turmeric whole had been introduced to the Standard and definitions had been revised. Further, the revision was considered necessary to update the requirements for turmeric whole and ground and also to align the requirements with the ISO Standard.

Turmeric is one of the commonly used spices in Sri Lanka. In addition, it is also used to a limited extent as a colouring substance and has an application in the pharmaceutical and cosmetic industries.

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 analysis shall be rounded off in accordance with **SLS 102**. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

In the revising of this Standard, the assistance derived from the related publications of the International Organization for Standardization (ISO) and the Bureau of Indian Standards is gratefully acknowledged.

1 SCOPE

This Standard prescribes the requirements and methods of sampling and test for turmeric (*Curcuma longa* L.), whole and ground.

2 REFERENCES

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

| | | |
|-----|-----|---|
| CS | 124 | Test sieves |
| SLS | 102 | Rules for rounding off numerical values |
| SLS | 143 | Code of practice for general principles of food hygiene |
| SLS | 186 | Methods of test for spices and condiments |
| | | Part 1: Preparation of ground sample for analysis |
| | | Part 2: Determination of extraneous matter and foreign matter content |
| | | 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 12: Determination of degree of fineness of grinding – Hand sieving method (Reference method) |
| | | Part 13: Turmeric – Determination of colouring power – Spectrophotometric method |
| SLS | 310 | Method for the sampling of spices and condiments |
| SLS | 428 | Random sampling methods |
| SLS | 467 | Code of practice for labeling of prepackaged foods |
| SLS | 516 | Methods of test for microbiology of food and animal feeding stuffs Part 2/ Section 2: Horizontal method for the enumeration of yeast and moulds/ colony count technique in products with water activity less than or equal to 0.95 Part 5: Horizontal method for the detection of <i>Salmonella</i> spp. |
| SLS | 1327 | Code of practice for Spices and other dried aromatic plants |

3 DEFINITIONS

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

3.1 whole turmeric: Cured primary or secondary rhizomes, commercially called as bulbs or fingers of *Curcuma longa* L. The rhizomes shall be dry, well developed and shall have the shape and typical colour of the variety. The rhizomes are cured by soaking them in boiling water and then drying them to avoid regeneration. The cured rhizomes may be in natural state or machine polished

3.2 ground turmeric: Turmeric powder shall be the product obtained by grinding of clean, cured dry and well developed rhizomes commercially called bulbs or fingers of the plant *Curcuma longa* L. It shall possess its morphological identity when examined under a microscope

3.3 defective rhizomes: Immature, small shriveled fingers and/ or bulbs, internally damaged, hollow or porous rhizomes, rhizomes scorched by boiling and other types of damaged rhizomes

3.4 extraneous and foreign matter: All material other than rhizomes or powder of turmeric. Extraneous matter includes chaff and dried leaves. Extraneous matter does not include defective rhizomes. Foreign matter includes other plant material, stones, clay particles, dust and dirt

4 GENERAL REQUIREMENTS

4.1 Hygiene

The products shall be processed, packaged, stored and distributed in accordance with the hygienic conditions prescribed in **SLS 143** and **SLS 1327**.

4.2 Aroma and flavour

Turmeric, whole and ground shall have the characteristic aroma and flavour. It shall be free from foreign aroma and flavour including rancidity and mustiness.

4.3 Absence of moulds, insect infestation and animal excreta

Turmeric whole and ground shall be free from mould growth, living and dead insects, insect fragments and animal excreta, visible to the naked eye (corrected, if necessary, for abnormal vision), or using the required magnifying instrument. If the magnification exceeds $\times 10$, this fact shall be mentioned in the test report. The proportion of insect damaged matter shall not exceed 1 per cent (*m/m*).

In case of disputes, the method given in **Part 8** of **SLS 186** shall be applied.

4.4 Extraneous matter

4.4.1 *Whole turmeric*

Extraneous matter shall not exceed 1 per cent by mass in whole turmeric when examined visually by the method described in **Part 2** of **SLS 186**.

4.4.2 *Ground turmeric*

The product shall be examined by microscope and shall not contain any morphological extraneous matter.

4.5 Absence of adulterants

The product shall not contain any deleterious matter added to it so as to render it injurious to health and shall be free from all admixtures including morphological extraneous matter, added starch when examined through a microscope and shall be free from added colouring substances.

4.6 Fineness

The product shall be ground to such fineness that 100 per cent by mass of it passes through a sieve of aperture size 500 μm , conforming to **CS 124** when determined by the method specified in **Part 12** of **SLS 186**.

4.7 Defective rhizomes

The proportion of defective rhizomes shall not exceed 5 per cent by mass.

4.8 Other requirements

Turmeric whole and ground shall also comply with the requirements given in **Table 1** when tested according to the methods given in **Column 5** of the table.

TABLE 1 – Requirements for turmeric, whole and ground

| SI No (1) | Characteristic (2) | Requirement | | Method of test (5) |
|--------------|---|--------------|---------------|-------------------------|
| | | Whole (3) | Ground (4) | |
| i) | Moisture, per cent by mass, max. | 10.0 | 10.0 | SLS 186 : Part 5 |
| ii) | Total ash on dry basis, per cent by mass, max. | -- | 9.0 | SLS 186 : Part 3 |
| iii) | Acid insoluble ash on dry basis, per cent by mass, max. | -- | 1.5 | SLS 186 : Part 4 |
| iv) | Curcumin content on dry basis, per cent by mass, min. | 3.0 | 3.0 | SLS 186: Part 13 |

4.9 Microbiological limits

Ground turmeric shall comply with the limits given in Table 2 when tested according to the methods given in Column 4 of the table.

TABLE 2 – Microbiological limits for ground turmeric

| SI No (1) | Test organism (2) | Limit (3) | Method of test (4) |
|--------------|-----------------------------|-----------------|-----------------------------------|
| i) | <i>Salmonella</i> , in 25 g | Absent | SLS 516: Part 5 |
| ii) | Moulds, cfu, per g, max. | 10 ³ | SLS 516: Part 2/ Section 2 |

4.10 Contaminants

4.10.1 Pesticide residues

Turmeric, whole and ground shall be cultivated and processed with special care under Good Agricultural Practices and Good Manufacturing Practices, so that residues of those pesticides which may be required in the production do not remain or if practically unavoidable, are reduced to the maximum extent possible.

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.

4.10.2 Heavy metals

Turmeric, whole and ground shall not exceed the limits for heavy metals when tested according to the methods given in Column 4 of Table 3.

TABLE 3 – Limits for heavy metals

| Sl No. (1) | Heavy metal (2) | Limit (3) | Method of test (4) |
|----------------------|-----------------------------|---------------------|------------------------------|
| i) | Arsenic, as As, mg/ kg, max | 0.1 | AOAC 986.15 |
| ii) | Lead, as Pb, mg/ kg, max | 2.0 | AOAC 999.11 |
| iii) | Cadmium, as Cd, mg/ kg, max | 0.1 | AOAC 999.11 |

5 PACKAGING

The packaging material which comes into contact directly with the product shall be sufficiently inert to preclude substances from being transferred to food in quantities large enough to endanger human health or to bring about an unacceptable change in the composition of the product or deterioration in its organoleptic properties.

5.1. Bulk containers

Turmeric whole shall be packaged in suitable, clean and sound bags, packages or containers made of a material which shall not affect the product and which shall protect the product from the ingress of moisture and egress of volatile matter.

5.2 Retail containers

Turmeric whole or ground shall be packaged in suitable, air-tight food grade containers which shall be strong enough to withstand pressure in handling.

6 MARKING AND/ OR LABELING

6.1 The following shall be marked or labeled legibly and indelibly on each package/ container:

- a) The common name of the product as “Turmeric – Whole” or “Turmeric – Powder”;
- b) Brand name or trade name, if any;
- c) Net mass in “g” or “kg”;
- d) Name and address of the manufacturer and packer or distributor;
- e) Name and address of the producer or trader (in case of whole turmeric in bulk packages);
- f) Batch or code number or decipherable code marking;
- g) Date of manufacture (in case of retail packages);
- h) Year of harvest (in case of whole turmeric in bulk packages);
- j) Date of expiry;
- k) In case where turmeric whole or ground is imported in bulk and repackaged, the date of repackaging;
- m) Country of origin, in case of imported products; and
- n) Instructions for storage and handling, if any.

6.2 The marking and labeling shall also be in accordance with **SLS 467**.

7 SAMPLING

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

8 METHODS OF TEST

Turmeric shall be tested for ascertaining conformity of the material to the requirements of this Standard by the methods of test given in **Part 2, Part 3, Part 4, Part 5, Part 8, Part 12 and Part 13 of SLS 186, Section 2 of Part 2 and Part 5 of SLS 516** and Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC), 20th Edition, 2016.

9 CRITERIA FOR CONFORMITY

9.1 Each container examined as in **A.6.1** satisfies the packaging, marking and/ or labeling requirements.

9.2 Each bulk container examined as in **A.6.2** satisfies the relevant requirements given in Clauses **4.2** and **4.5**.

9.3 The composite sample tested as in **A.6.3** satisfies the requirements given in Clauses **4.3, 4.4, 4.6, 4.7, 4.8** and **4.10.2**.

9.4 Each sample tested from turmeric ground as in **A.6.5** satisfies the requirements given in Clause **4.9**.

APPENDIX A SAMPLING

A.1 LOT

In any consignment all the containers of the same size filled with the product belonging to one batch of manufacture or supply shall constitute a lot.

A.2 GENERAL REQUIREMENTS OF SAMPLING

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

A.2.1 Samples shall be drawn in a protected place not exposed to damp, air, dust or soot.

A.2.2 The sampling instruments shall be clean and dry when used. When drawing samples for microbiological examination, the sampling instruments shall be sterilized.

A.2.3 Precautions shall be taken to protect the samples, the product being sampled and the sample container from adventitious contamination.

A.2.4 The samples shall be placed in clean and dry containers. The size of the sample containers shall be of such size that they are almost completely filled by the sample. When drawing samples for microbiological examination, the sample containers shall be sterilized.

A.2.5 The sample containers shall be sealed, air-tight after filling and marked with necessary details of sampling.

A.2.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the room temperature.

A.3 SCALE OF SAMPLING

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

A.3.1 Turmeric whole - Sampling from bulk containers

A.3.1.1 Representative samples of the product for ascertaining conformity to the requirements of this Standard shall be drawn in accordance with **SLS 310**.

A.3.2 Turmeric whole or ground - Sampling from retail containers

A.3.2.1 The number of retail containers to be selected from a lot shall be in accordance with Table 4.

Table 4 – Scale of sampling

| No of retail containers in the lot (1) | No of containers to be selected (2) |
|---|--|
| Up to 280 | 10 |
| 281 to 500 | 12 |
| 501 to 1200 | 15 |
| 1201 and above | 20 |

A.3.2.2 The retail containers 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.3.3 Turmeric ground - Sampling from bulk containers

Samples shall be taken from all bulk containers in the lot.

A.4 PREPARATION OF SAMPLES

A.4.1 Samples from turmeric whole

A.4.1.1 A sufficient quantity of material shall be drawn from each container and mixed to form a composite sample.

A.4.1.2 Samples of the turmeric whole shall be prepared in accordance with **Part 1** of **SLS 186**.

A.4.1.3. Samples of turmeric whole shall be ground so that all material passes through a sieve with aperture of size 500 µm. The sample thus obtained shall be transferred to a sample container and sealed air-tight.

A.4.1.4 The material thus obtained shall be used for determining the requirements given in **4.8, 4.9** and **4.10.2**.

A.4.2 Samples from turmeric ground - from retail containers

Sufficient quantity of material shall be drawn from each container selected as in **A.3.2.1** and mixed to form a composite sample of at least 700 g and the composite sample thus obtained shall be transferred to a sample container and sealed air-tight.

A.4.3 Samples from turmeric ground - from bulk containers

Sufficient quantity of material shall be drawn from five different places of each bulk container using an appropriate sampling instrument and mixed to form a composite sample of at least 700 g. The sample thus obtained shall be transferred to a sealed air-tight sample container.

A.5 REFERENCE SAMPLE

If a reference sample is required the size of the sample to be taken shall be three times the size given in **A.4.1, A.4.2** or **A.4.3** and the samples so obtained shall be divided into three equal parts using coning and quartering method. Samples shall be transferred into three sample containers and sealed air-tight. One such sample shall be marked for the purchaser, one for the supplier and the third shall be kept at a place agreed to between the purchaser and the supplier to be used in case of dispute.

A.6 NUMBER OF TESTS

A.6.1 Each container selected as in **A.3.1, A.3.2** or **A.3.3** shall be inspected for packaging and marking and/ or labeling requirements.

A.6.2 Each container selected as in **A.3.1** or **A.3.2** or **A.3.3** shall be examined for the requirements given in **4.2** and **4.5**.

A.6.3 The composite sample obtained as in **A.4.1**, **A.4.2** or **A.4.3** shall be tested for the requirements given in **4.3**, **4.4**, **4.6**, **4.7**, **4.8** and **4.10.2**.

A.6.4 A sub sample, each compositing 03 containers shall be drawn from the containers selected as in **A.3.2** or **A.3.3** and tested for microbiological limits (*see 4.9*).

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.



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.