SRI LANKA STANDARD 148:2020

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SPECIFICATION FOR COCOA POWDER

(Second revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
SPECIFICATION FOR COCOA POWDER
(Second revision)

SLS 148: 2020

Gr.8

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17,Victoria Place
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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 COCOA POWDER
(Second revision)

This Standard was finalized by the Sectoral Committee on food product and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2020-05-27.

This Standard was first published in 1972 and revised in 1993. This revision was considered necessary to update the specification to be in line with the developments in the industry. Microbiological limits and conformant have been included. Cocoa sugar mixture has been removal from this standard.

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 completed 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, places retained in the rounded off value shall be the same as that of the specified value in this Standard.

In revising this Standard, the valuable assistance derived from the following publications is gratefully acknowledged:

CODEX STAN 105 - 1981 Cocoa powders and dry cocoa-sugar mixtures
IS 1164 :1986 Cocoa powder (Third Revision)
IS 6762 :1986 Drinking chocolate (Second Revision)

1 SCOPE

This Standard prescribes the requirements and methods of sampling and tests for cocoa powder.

2 REFERENCES

SLS 102	Rules for rounding off numerical values
SLS 106	Cocoa beans
SLS 143	General principles of food hygiene
SLS 301	Determination of copper
SLS 311	Determination of lead
SLS 312	Determination of arsenic
SLS 326	Chocolate
SLS 428	Random sampling methods
SLS 467	Marking and labelling of prepackaged foods
SLS 516	Methods of test for microbiology of food and animal feeding stuffs Part 2: Horizontal method for the enumeration of yeasts and moulds Section 2: Colony count technique in products with water activity less than or equal to 0,95

Part 5: Horizontal method for the detection of *Salmonella* spp.
SLS 910 Maximum residue limits for pesticides in food

Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC), 20th Edition, 2016

3 DEFINITIONS

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

3.1 cocoa nib: Fermented and dried whole seed of cocoa ***(****Theobroma cacao* L. without the skin or testa.

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3.2 cocoa press cake: Material obtained by partial removal of fat from the ground cocoa nib.

3.3 coco powder: Product obtained by mechanical transformation of cocoa press cake in to powder.

4 TYPES

Cocoa powder shall be of two types :

Type 1 Cocoa powder; and
Type 2 Fat reduced cocoa powder.

5 INGREDIENTS

5.1 Basic ingredient

5.1.1 Cocoa

5.2 Optional ingredients

5.2.1 *Spices*

5.2.2 *Salt,* conforming to **SLS 80.**

5.2.3 *Food Additives*

5.2.3.1 Permitte flavouring substances, natural or synthetic excluding chocolate or milk flavours.

a) Vanillin
b) Ethylvanillin

5.2.3.2 *Alkalizing agents,*

singly or in combination, not exceeding 5 per cent by mass (expressed as anhydrous Potassium carbonate on fat free basis).

a)	Ammonium carbonate	INS 503 (i)
b)	Potassium carbonate	INS 501 (i)
c)	Sodium carbonate	INS 500 (i)
d)	Ammonium hydroxide	INS 527
e)	Potassium hydroxide	INS 525
f)	Sodium hydroxide	INS 524
g)	Magnesium carbonate	INS 504 (i)
h)	Magnesium hydrogen carbonate	INS 504 (ii)
i)	Magnesium hydroxide	INS 528
j)	Calcium carbonate	INS 170 (i)

5.2.3.3 *Neutralizing agents*

a)	Phosphoric acid	INS 280	limited by GMP
b)	Citric acid	INS 330	
c)	L-tartaric acid *or in combination*	INS 334 INS 335 (i) INS 337	

5.2.4 *Emulsifiers*

a)	Mono-and di glycerides of edible fatty acids	INS 471	limited by GMP
b)	Lecithin	INS 332 (i)	
c)	Ammonium salts of phosphatidic acids	INS 442	
d)	Sucrose esters of fatty acid,	INS 473	

Total emulsifiers shall not exceed 1.5 per cent by mass in the finished product.

6 REQUIREMENTS

6.1 Cocoa powder shall be produced from cocoa beans conforming to **SLS 106.**

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

6.3 The product shall be in the form of a free flowing powder without lumps. It shall have the colour, taste and flavor. It shall be free from rancidity and/or of odours extraneous matter, insect infestation and rodent contamination.

6.4 Cocoa powder shall not exceed to the requirements given in table **1** when tested in accordance with the methods prescribed in column **4**.

6.5 Cocoa powder shall not exceed with the microbiological limits given in Table **2** when tested in accordance with the methods prescribed in Column **4.**

Table 1 – Requirements for cocoa powder

SI No (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Moisture, per cent by. mass, max.	7.0	Appendix **B**
ii)	Cocoa butter, on dry basis, per cent by mass		
	cocoa powder, min.	20	Appendix **C**
	fat reduced cocoa powder	8 to 20	
iii)	Toted ash, on dry and fat free basis, per cent by mass, max.		
	untreated cocoa powder	9.0	Appendix **D**
	alkali treated cocoa powder	14.0	
iv)	Acid insoluble ash, on dry and by		
	fat free basis, per cent mass, max.	0.5	Appendix **E**
v)	Alkalinity of ash, as K_2 O, on dry and fat free basis, per cent by mass, max.		
	untreated cocoa powder	5.0	Appendix **F**
	alkali treated cocoa powder	10.0	
vi)	Crude fibre, on dry and fat free basis, per cent by mass, max	7.0	Appendix **G**

TABLE 2 – Microbiological limits

SI No. (1)	Microorganism (2)	Limit (3)	Method of test (4)
i)	Yeasts and moulds, cfu/ 100 g, max.	1×10^2	**SLS 516: Part 2: Section 2**
ii)	*Salmonella* spp; in 25 g	Absent	Appendix **H**

7 CONTAMINANTS

7.2 Potentially toxic elements

The product shall not exceed the limits for potentially toxic elements given in Table **3**, when tested in accordance with to the methods given in Column **4** of the table.

TABLE 3 - Limits for potentially toxic element

SI No (1)	Heavy metal (2)	Limit (3)	Method of test (4)
i)	Arsenic, as As, mg/kg, max.	0.5	**AOAC 986.15/ SLS 312**
ii)	Lead,as Pb, mg/kg, max.	0.5	**AOAC 994.02/ SLS 311**
iii)	Cadmium as Cd, mg/kg, max.	0.1	**AOAC 999.11/ SLS 303**

7.1 Pesticide residues

Wheat flour shall be processed with special care under Good Agricultural Practices and Good Manufacturing Practice **SLS 143**, so that residues of those pesticides which may be required in the cultivation and production do not remain or if practically unavoidable, are reduced to the maximum extent possible. The product shall comply with the maximum pesticide residue limits given 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.

8 PACKAGING

8.1 The product shall be packaged in an air tied food grade containers/ packages. 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.

8.2 If the product is individually wrapped, the wrapping material shall be of food grade packaging material. The wrapped or unwrapped material shall be bulk packaged or further packaged in clean, moisture proof, airtight containers/ packages. In the case of printed packaging material printing ink shall not come into direct contact and penetrate with the product.

9 MARKING AND/ OR LABELING

9.1 Each container shall be marked and labelled legibly and indelibly with the following:

a) Name of the product, including type as “cocoa powder” or “fat reduced cocoa powder”
b) Brand name/ trade mark, if any;
c) Net mass, in “g” or “kg”
d) Name and address of the manufacturer;
e) Date of expiry;
f) Date of manufacture;
g) Batch or code number or a decipherable code marking;
h) List of ingredients; and
j) Country of origin, in case of imported products.

9.2 Marking shall also be in accordance with **SLS 467.**

NOTE
Attention is drawn to certification facilities offered by the Sri Lanka Institution. See the inside back cover of this standard.

10 METHODS OF TEST

Tests shall be carried out as prescribed in **SLS 311, SLS 312**, **SLS 326, Section 2/ Part 2** and **Part 5** of **SLS 516** Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC) and Appendices **B** to **H** of this Standard.

11 CRITERIA FOR CONFORMITY

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

11.1 Each container inspected as in **A.5.1** satisfies the packaging, marking and/ or labelling requirements.

11.2 The samples when tested as in **A.5.2** satisfies the requirement for moisture and requirements given in Clause **6.5**.

11.3 The composite sample tested as in **A.5.3** satisfies the requirements given in Clause **6.3, 6.4** (except moisture) and **7**.

APENDIX A
COMPLIANCE OF A LOT

A.1 LOT

In any consignment all the containers of the product of same size 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, the following precautions shall be observed:

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

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

A.2.3 The samples shall be placed in clean, dry and moisture proof containers. The sample for microbiological examination shall be kept in sterilized containers.

A.2.4 The sample containers shall be sealed air-tight after filling and marked with necessary details of sampling.

A.2.5 The samples shall be stored in such a manner that there will be no deterioration of quality of the material.

A.3 SCALE OF SAMPLING

A.3.1 The number of containers to be selected from a lot shall be in accordance with table **4.**

TABLE 4 – Scale of sampling

Number of containers In the lot (1)	Number of containers to be selected (2)
Up to 150	03
151 to 500	05
501 to 1 200	07
1 201 to above	10

NOTE

If retail containers are packed in cartons, 10 per cent of the cartons subject to a minimum of 3, shall be selected first. Approximately an equal number of retail containers shall be taken from each carton selected, to get a sample size as given in Table 4.

A.3.2 The 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.4 PREPARATION OF SAMPLES

A.4.1 Microbiological examination

Approximately equal quantities of material shall be taken from top, middle and bottom portions of each container selected as in **A.3.1** using an appropriate sampling instrument, mixed together and reduced to get a composite sample of required size. The composite sample shall be transferred to a sample container.

A.4.2 Composite sample

Approximately equal quantities of material shall be taken from top, middle and bottom portions of each container selected as in **A.3.1** using an appropriate sampling instrument, mixed together and reduced to get a composite sample of required size. The composite sample shall be transferred to a sample container.

A.5 NUMBER OF TESTS

A.5.1 Each container selected as **A.3.2** shall be inspected for packaging and marking requirements.

A.5.2 The samples prepared as in **A.4.1** shall be tested for the requirements given in **6.4** and the moisture content.

A.5.3 The composite sample prepared as in **A.4.2** shall be tested for the requirements given in **6.2, 6.3** (except for moisture) and **7.2**.

APPENDIX B
DETERMINATION OF MOISTURE

B.1 Apparatus

B.1.1 Dish, of stainless steel, silica or platinum

B.2 PROCEDURE

Weigh to the nearest milligram, about 2 g of the well mixed sample in the dish **(B.1.1)** previously dried in the oven and weighed. Dry in the oven for 4 hours. Cool in desiccator and weigh. Repeat the process of drying, cooling and weighing at 30-minute intervals until the difference between two successive weighings does not exceed 1 mg.

B.3 CALCULATION

$$\text{Moisture, per cent by mass} = \frac{m_1 - m_2}{m_1 - m_0} \times 100$$

where,

m_1 is the mass, in g, of the dish with the sample before drying;
m_2 is the mass, in g, of the dish with the sample after drying; and
m_0 is the mass, in g, of the empty dish.

APPENDIX C
DETERMINATION OF COCOA BUTTER

C.1 APPARATUS

C.1.1 Soxhlet extraction apparatus

C.1.2 Oven, maintained at 105 ± 2 ^{o}C

C.2 REAGENT

C..2.1 Petroleum ether, boiling range 40 ^{O}C to 60 ^{o}C.

C.3 PROCEDURE

C. 3.1 Dry the soxhlet flask in the oven **(C.1.2)** for 30 minutes. Cool in a desiccator and weigh.

C. 3.2 weigh, to the nearest milligram about 5 g to 10 g of the dried sample in the fat extraction thimble. Place the thimble in the extraction apparatus. Extract with petroleum ether **(C. 2)** for about 16 hours. Evaporate the solvent. Dry the flask in the oven, cool in a desiccator and weigh. Repeat the process of drying, cooling and weighing at 30-minute intervals until the difference between two successive weighings does not exceed 1 mg.

NOTE
Reserve the material for the other determinations

C.4 CALCULATION

$$\text{Cocoa butter, on dry basis, per cent by mass} = \frac{m_1 - m_2}{m_0} \times \frac{100}{(100 - M)}$$

M is the moisture, per cent by mass (see Appendix **B**);
m_1 is the mass, in g, of the flask with the cocoa butter;
m_2 is the mass, in g, of the empty flask **(C.3.1)**; and
m_0 is the mass, in g, of the sample.

APPENDIX D
DETERMINATION OF TOTAL ASH

D. 1 APPARATUS

D. 1. 1 *Dish, of* silica or platinum.

D. 1.2 *Oven,* maintained at 105 ± 2 °C.

D. 1.3 *Muffle furnace,* maintained at 600 ± 20 °C.

D.2 PROCEDURE

Weigh, to the nearest milligram, about 10 g of the sample in the dish **(D.1. 1).** Char the material using a suitable burner or a hot plate for about one hour. Complete the ignition in the muffle

furnace **(D.1.3)** until a grey ash is obtained. Cool in a desiccator/ and weigh. Repeat the process of igniting, cooling and weighing at 30- minute intervals until the difference between two successive weighing does not exceed 1 mg.

D. 3 CALCULATION

$$\text{Total ash, on dry and fat basis, per cent by mass} = \frac{m_1 \times 10^6}{(100 - F)(100 - M)\, m_2}$$

m_1 is the mass, in g, of the ash;
m_2 is the ma**ss,** in g, of the sample;
M is the moisture, per cent by mass (see Appendix **B**); and
F is the fat on dry basis, per cent by mass (see Appendix **C**).

APPENDIX E
DETERMINATION OF ACID INSOLUBLE ASH

E. 1 PROCEDURE

Dissolve the ash obtained in **D.2** in 25 ml of 5 M hydrochloric acid. Cover with a watch glass and heat on a water bath for 10 minutes. Cool and filter through slow ashless filter paper. wash with water until the washings are free from the acid. Place the filter paper with the residue in the dish and dry in the oven **(D.1.2)** for about 30 minutes. Char using a suitable burner or a hot plate. Ignite in the muffle furnace **(D.1.3)** for one hour. Cool in a desiccator and weigh. Repeat the process of igniting, cooling and weighing at 30-minute intervals until the difference between two successive weighing does not exceed 1 mg.

E. 2 CALCULATION

$$\text{Acid insoluble ash, on dry and fat free basis, per cent by mass} = \frac{m_1 \times 10^4}{(100 - F)(100 - M)\, m_2}$$

Where,

m_3 is the mass, in g, of the acid insoluble ash;
m_2 is the ma**ss,** in g, of the sample;
M is the moisture, per cent by mass;
F is the fat on dry basis, per cent by mass;

APPENDIX F
DETERMINATION OF ALKALINITY OF ASH

F.1 REAGENTS

F.1.1 *Hydrochloric and*, approximately 0.1 mol/1 solution.

F.1.2 *Sodium hydroxide*, c(NaOH) = 0.1 mol/1 solution, standardized.

F.1.3 *Bromocresol green indicator.*

F.1.4 *Phenolphthalein indicator*

F.2 PROCEDURE

F.2.1 Weigh, to the nearest milligram, about 2 g of the dried fat free sample and ash as prescribed in **D.2** Add a known excess of Hydrochloric acid **(F.1.1)** and boil for 2 minutes. Cool and titrate the excess of acid against Sodium hydroxide **(F.1.2)** using bromocresol green as indicator, till the colour changes to green.

F.2.2 Titrate 10 ml of hydrochloric acid against Sodium hydroxide using phenol phenolphthalein as indicator, till the colour changes to pink.

F.3 CALCULATION

$$\text{Alkalinity of ash, as } K_2O\text{, on dry and fat free basis, per cent by mass} = 4.71 \times C \times \frac{V_2\ V_1}{10} \times V_3 \Big/ m$$

Where,

c is the concentration, in mol/1, of Sodium hydroxide solution;
V_2 is the volume, in ml, of Hydrochloric acid added **(F.2.1)**
V_1 is the volume, in ml, of Sodium hydroxide corresponding to to 10 ml of Hydrochloric acid **(F.2.2)**
V_3 is the volume, in ml, of Sodium hydroxide corresponding to the excess of acid; and
m is the mass, in g, of the sample.

APPENDIX G
DETERMINATION OF CRUDE FIBRE

G.1 APPARATUS

G.1.1 *Oven,* maintained at 105 ± 2 ^{o}C

G.1.2 *Reflux condenser*

G.1.3 *Buchner funnel,* with perforated plate covered a piece of cotton cloth or filter paper to serve as a support for a circular piece of suitable filter paper, washed with boiling water.

G.1.4 *Crucible,* with a thin, compact layer of ignited asbestos.

G.1.5 *Muffle furnace,* maintained at 600 ± 20^{o}C

G.2 REAGENTS

G.2.1 *Sulfuric acid,* c(H_2 SO_4) = 0.128 mol/1 solution.

G.2.2 *Sodium hydroxide,* c(NaOH) = 0.313 mol/1 solution.

G.2.3 *Ethyl alcohol,* 95 per cent (V/V)

G.3 PROCEDURE

G.3.1 weigh, to the nearest milligram, about 2 g of the dried fat free sample in a one liter flask. Add 200 ml of boiling Sulfuric acid **(G.2.1)** and immediately connect the flask to a reflux condenser **(G.1.2)**. Bring to boil within one minute. Continue boiling for exactly 30 minutes while rotation the flask frequently ensuring that all the material is in contact with the acid. Pour into the prepared funnel **(G.1.3)** and wash with boiling water until the washings are no longer acidic to litmus.

Boil 200 ml of Sodium hydroxide **(G.2.2)** in a reflux condenser. Wash the residue in the funnel with boiling Sodium hydroxide into the flask. Immediately connect the flask to the reflux condenser and boil exactly for 30 minutes. Immediately filter through the funnel.

Wash the residue thoroughly with boiling water and transfer to the crucible **(G.1.4).** Wash the residue thoroughly first with hot water and then with 15 ml of Ethyl alcohol **(G.2.3).**

G.3.2 Dry the crucible with contents in the oven **(G.1.1).** Cool in a desiccator and weigh. Repeat the process of drying, cooling and weighing until the difference between two successive weighings does not exceed 1 mg.

G.3.3 Incinerate the contents of the crucible in the muffle furnace **(G.1.5).** Cool in a desiccator and weigh to the nearest 1 mg.

G.4 CALCULATION

$$\text{Crude fibre, on dry and fat free basis , per cent by mass} = \frac{m_1 \times 10^6}{m_2 (100 - F)(100 - M)}$$

M is the moisture, per cent by mass (see Appendix **B**);
m_1 is the mass, in g, of the insoluble matter **(G.3.2)**;
m_2 is the mass**,** in g, of the ash **(G.3.3)**; and
m_o is the mass, in g, of the sample.

APPENDIX H
TEST FOR *Salmonella* spp.

H.1 Media and solutions

H.1.1 *Brilliant green solution*, 1 per cent

Brilliant green dye	1 per cent
Distilled water	100 ml

Dissolve brilliant green in sterile distilled water.

H.1.2 *Reconstituted nonfat dry milk*

Nonfat dry milk	100g
Distilled water	1000 ml

Suspend nonfat dry milk in distilled water and dissolve by swirling sterilize at 121^{o}C for 15 minutes.

H.2 PRE – ENRICHMENTS

Weigh aseptically 25 g of sample into a sterile blender jar. Add 225 ml of milk **(H.1.2)** and blend for 2 minutes. Transfer aseptically into sterile 500 ml screw cap container. Determine pH with test paper. Adjust if necessary to 6.8 ±0.2. Add 0.45 ml of brilliant green solution **(H.1.1)** and mix well. Loosen the cap and incubate at 37^{o}C for 18 hours to 24 hours.

Proceed as in **SLS 516 : Part 5**.

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SLS CERTIFICATION MARK

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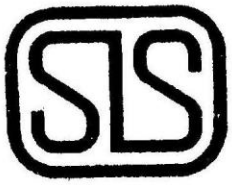

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SRI LANKA STANDARDS INSTITUTION

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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.

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