

इलायची (कैप्सूल, बीज और पिंसी) —
विशिष्टि
(तीसरा पुनरीक्षण)

Cardamom (Capsules, Seeds and
Powder) — Specification
(Third Revision)

ICS 67.220.10

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भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Spices and Condiments Sectional Committee had been approved by the Food and Agriculture Divisional Council.

Cardamom (*Elaichi*) is one of the important and commonly used materials for spicing in the Indian diet. It is also one of the commodities exported widely from India.

This standard was originally published in 1961 and first revised in 1966. The second revision was published in 1984 to include modifications with respect to moisture and volatile oil content. This third revision is being carried out to align with latest regulatory requirements and market practices. The following modifications have been incorporated in this revision:

- a) The microbiological requirements have been aligned with regulatory requirements;
- b) Limits of aflatoxins have been incorporated;
- c) New powdered form and its requirements have been added;
- d) A new grade 'AGSEB' has been added in cardamom capsules; and
- e) References have been updated.

This standard takes into consideration the prevailing methods of trade and has adopted grades formulated by the Directorate of Marketing and Inspection for being incorporated in the *Agmark (Grading and Marking) Rules*, framed under the *Agricultural Produce (Grading and Marking) Act, 1937*.

In the preparation of this standard due consideration has been given to the *Food Safety and Standards Act, 2006* and the Rules and the Regulations framed thereunder and the *Legal Metrology (Packaged Commodities) Rules, 2011*. However, this standard is subject to restrictions imposed under these rules, wherever applicable.

The composition of the technical committee responsible for formulation of this standard is listed in Annex B.

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 IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
CARDAMOM (CAPSULES, SEEDS AND POWDER) —
SPECIFICATION
(Third Revision)

1 SCOPE

1.1 This standard prescribes the requirements for cardamom capsules, seeds and powder of *Elettaria cardamomum* (L.) Maton (*Choti Elachi*) of the family Zingiberaceae.

1.2 This standard does not cover the capsules of the genus *Amomum*.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below:

<i>IS No.</i>	<i>Title</i>
IS 1797 : 2017	Spices and condiments — Methods of test (<i>third revision</i>)
IS 5887 (Part 3) : 1999/ISO 6579 : 1993	Methods for detection of bacteria responsible for food poisoning: Part 3 General guidance on methods for the detection of <i>Salmonella</i> (<i>second revision</i>)
IS 5887 (Part 6) : 2012/ISO 7932 : 2004	Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of presumptive bacillus cereus: Part 6 Colony count technique at 30 °C (<i>first revision</i>)
IS 14216 : 1994	Code for hygienic practice for spices and condiments processing units
ISO 15213 : 2003	Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of sulfite-reducing bacteria growing under anaerobic conditions
IS 16287 : 2015	Foodstuffs — Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products — High performance liquid chromatographic method

3 DEFINITION**3.1 Mass Per Litre**

The mass of cardamoms contained in one litre volume.

3.2 Extraneous Matter

The portions of calyx pieces, stalk bits and other extraneous matter in cardamom capsules and seeds.

3.3 Empty and Malformed Capsules

Capsules which are without any seeds are empty capsules. Capsules which are scantily filled with seeds are malformed capsules. For this purpose, 100 capsules from the sample shall be opened out and the number of empty and malformed capsules counted.

3.4 Immature and Shriveled Capsule

The capsules which are not fully developed and/or have shriveled appearance.

3.5 Black and Splits

Blacks include capsules having visible blackish to black colour and splits include those capsules which are open at corners for more than half the length. For this purpose, 100 capsules shall be taken from the sample and the number of blacks and splits separated and counted.

3.6 Light Seeds

Light seeds include seeds which are brown or red in colour, broken or immature and shriveled.

4 REQUIREMENTS**4.1 Description****4.1.1 Cardamoms with Capsules**

The cardamoms shall be dried capsules of nearly ripe fruits of *Elettaria cardamomum* (L.) Maton. The capsules shall be of colour ranging from light green to brown or cream to white when bleached with sulphur dioxide; global in size or three-cornered having a ribbed appearance. The capsules may be clipped and their pedicels removed. The capsules shall be well formed and with sound cardamom seeds inside. It shall have characteristic flavor free from foreign odour, mustiness or rancidity. The product shall be free from added colouring matter and other harmful substances. The cardamoms may be graded on the basis of colour, clipping, size, mass

per litre, bleaching or otherwise, proportions of extraneous matter, and place of origin (*see* Table 3).

4.1.2 Cardamom Seeds

Cardamom seeds are decorticated separated seeds from the dried capsules of nearly ripe fruits of *Elettaria cardamomum* (L.) Maton. The seeds shall have characteristic flavor free from foreign odour, mustiness or rancidity. The product shall be free from added colouring matter and other harmful substances. The cardamom seeds may be graded on the basis of mass per litre and proportions of extraneous matter and light seeds (*see* Table 4).

4.1.3 Cardamom Powder

Cardamom powder is the powder obtained by grinding dried seeds of *Elettaria cardamomum* (L.) Maton. without addition of any other substance. It may be in form of small pieces of seeds or in finely ground form. It shall have characteristic flavor free from foreign odour, mustiness or rancidity. The powder shall be free from added colouring matter and other harmful substances.

4.2 Freedom from Moulds, Insects etc.

Cardamoms in capsules, seeds and powder shall be free from mould, living, dead insects, insect fragments and rodent contamination.

NOTE — Thrip marks alone on capsules shall not lend to the conclusion that the capsule has been infested by insects.

4.3 The portions of calyx pieces, stalk bits and other extraneous matter in cardamom capsules and seeds shall not be more than 1.0 and 2.0, percent by mass, respectively. The proportion of light seeds in cardamom seeds shall not be more than 3.0, percent by mass. The proportion of empty and malformed capsules in cardamom shall not be more than 3.0, percent by mass.

4.4 Cardamom capsules, seeds and powder, shall comply with the physical, chemical and microbiology requirements given in Table 1 and Table 2.

Table 1 Requirements for Cardamom, Capsules, Seeds and Powder
(Clauses 4.4 and 8)

SI No.	Characteristic	Requirement			Method of Test, Ref to IS or Annex
		Capsules	Seed	Powder	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Moisture content, percent by mass, <i>Max</i>	10.0 (Bleached)	10.0	11.0	9 of IS 1797
		13.0 (Half bleached)			
ii)	Total ash on dry basis, percent by mass, <i>Max</i>	8.5	8.5	8.0	6 of IS 1797
iii)	Volatile oil content on dry basis, percent by mass, <i>Min</i>	3.5	4.0	3.0	15 of IS 1797
iv)	Acid insoluble ash, percent by mass, <i>Max</i>	-	-	3.0	8 of IS 1797
v)	Total Aflatoxin, µg/kg, <i>Max</i>	30	30	30	IS 16287
vi)	Aflatoxin B1, µg/kg, <i>Max</i>	15	15	15	IS 16287

Table 2 Microbiological Requirements for Cardamom, Capsule, Seeds and Powder
(Clauses 4.4 and 8)

Sl No.	Characteristic	Requirement				Method of Test, Ref to IS or ISO
		Sampling Plan ¹⁾		Limit (cfu/g)		
(1)	(2)	n	c	m	M	(7)
i)	<i>Salmonella</i>	5	0	Absent/25g	NA	IS 5887 (Part 3)
ii)	<i>Bacillus cereus</i>	5	2	1x10 ³	1x10 ⁴	IS 5887 (Part 6)
iii)	Sulphite Reducing Clostridia (SRC)	5	2	1x10 ²	1x10 ³	ISO 15213

Note — For sampling plan see Annex A.

4.5 Hygienic Conditions

The Cardamom, capsule, seeds and powder shall be processed and packed under hygienic conditions (see IS 14216).

4.6 Pesticide residues and metallic contaminants in the product shall not exceed the limits as prescribed in the *Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011*.

5 PACKING AND MARKING

5.1 Packing

Cardamoms capsules, seeds and powder shall be packed in clean, sound and dry containers made of metal, glass, food grade polymers, and wood or jute bags. The wooden boxes and jute bags shall be suitably lined with moisture proof lining which does not impart any foreign smell to the product. The packing material shall be free from fungal or insect infestation and should not impart any foreign smell. Each container shall be securely closed and sealed.

5.2 Marking

The following particulars shall be marked directly on each package/container on a label attached to or fixed on the package:

- Name and address of the manufacturer or the packer;
- Name of the material (Capsule or seed or powder);
- The trade-name or brand name, if any;
- Grade designation, if any;
- Batch or code number;
- Net mass;

- Month and year of packing;
- Best before (month and year); and
- Any other marking required under the *Legal Metrology (Packaged Commodities) Rules, 2011*, and the *Food Safety and standards (Packaging and Labelling) Regulations, 2011*.

6 BIS Certification Marking

The product(s) conforming to the requirements of this standards may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

7 GRADES

7.1 The cardamoms in capsules and seed form may also be graded (see 4.1.1 and 4.1.2) before packing.

7.2 There shall be 25 grades of cardamom with capsules and 3 of cardamom seeds.

7.3 The designations of the grades and their requirements are given in Table 3 and Table 4 for cardamom with capsules and for cardamom seeds, respectively

8 SAMPLING

8.1 Representative samples of the material shall be drawn and tested for conformity to this specification as prescribed in Table 1 and Table 2.

Table 3 Grade Designations of Cardamom with Capsules and their Requirements
(Clause 7.2)

SI No.	Grade Designation	Trade Name	Extraneous Matter, Percent By Mass, <i>Max</i>	Empty and Malformed Capsules, Percent by Count, <i>Max</i>	Un-clipped Capsules, Percent by Count, <i>Max</i>	Immature and Shriveled Capsule, Percent by Weight, <i>Max</i>	Blacks and Splits, Percent By Count, <i>Max</i>	Size (Dia of Holes in mm of the Sieve on Which Retained)	Mass in g/1, <i>Min</i>	Colour	General Characteristics
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Alleppey green											
i)	AGSEB	Cardamom Superior Extra Bold	Nil	2.0	Nil	2.0	Nil	8.0	435	Deep green, green or light green	Kiln dried; 3-cornered and having a ribbed appearance
ii)	AGEB	Cardamom extra bold	Nil	2.0	Nil	2.0	Nil	7.0	400		
iii)	AGB	Cardamom bold	Nil	2.0	Nil	2.0	Nil	6.0	415		
iv)	AGS	Cardamom Superior	Nil	2.0	Nil	2.0	Nil	5.0	385		
v)	AGS1	Shipment green 1	Nil	3.0	Nil	3.0	10.0	4.0	350		
vi)	AGS2	Shipment green 2	Nil	3.0	Nil	3.0	12.0	4.0	320		
vii)	AGL	Light	Nil	-	Nil	-	15.0	3.5	260		
Coorg green											
viii)	CGEB	Extra bold	Nil	Nil	Nil	Nil	Nil	8.0	450	Golden to light creamy	Global shape, skin ribbed or smooth; the pedicels separated
ix)	CGB	Bold	Nil	2.0	Nil	3.0	Nil	7.5	435	Creamy light greenish to greenish or brownish to brown	
x)	CG1	Superior	Nil	3.0	Nil	3.0	Nil	6.5	415		
xi)	CG2	Coorg green or Motta green	Nil	3.0	3.0	3.0	Nil	6.0	385		
xii)	CG3	Shipment	Nil	3.0	5.0	3.0	10.0	5.0	350		
xiii)	CG4	Light	Nil	-	-	-	15.0	3.5	280		

Table 3 (Continued)

SI No.	Grade Designation	Trade Name	Extraneous Matter, Percent By Mass, <i>Max</i>	Empty and Malformed Capsules, Percent by Count, <i>Max</i>	Un-clipped Capsules, Percent by Count, <i>Max</i>	Immature and Shriveled Capsule, Percent by Weight, <i>Max</i>	Blacks and Splits, Percent By Count, <i>Max</i>	Size (Dia of Holes in mm of the Sieve on Which Retained)	Mass in g/1, <i>Min</i>	Colour	General Characteristics
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Bleached or half bleached											
xiv)	BL1		Nil	Nil	Nil	Nil	Nil	8.5	340	} creamy or dull white	Fully developed capsule, bleached, global or 3 cornered with skin ribbed or smooth
xv)	BL2		Nil	Nil	Nil	Nil	Nil	7.0	340		
xvi)	BL3		Nil	Nil	Nil	Nil	Nil	5.0	300		
Bleachable white											
xvii)	BW1	Mysore/Mangalore bleachable cardamom. Clipped	Nil A.	1.0	Nil	Nil	Nil	7.0	460	} White light green or light grey	Fully developed capsules suitable for bleaching
xviii)	BW2	Mysore/Mangalore bleachable cardamom. Unclipped	Nil A.	1.0	<i>Nil</i>	Nil	Nil	7.0	460		
xix)	BW3	Mysore/Mangalore bleachable bulk cardamom. Clipped	Nil	2.0	Nil	Nil	Nil	4.3	435		
xx)	BW4	Mysore/Mangalore bleachable bulk cardamom. Unclipped	Nil	2.0	Nil	Nil	Nil	4.3	435		

Table 3 (Concluded)

SI No.	Grade Designation	Trade Name	Extraneous Matter, Percent By Mass, <i>Max</i>	Empty and Malformed Capsules, Percent by Count, <i>Max</i>	Un-clipped Capsules, Percent by Count, <i>Max</i>	Immature and Shriveled Capsule, Percent by Weight, <i>Max</i>	Blacks and Splits, Percent By Count, <i>Max</i>	Size (Dia of Holes in mm of the Sieve on Which Retained)	Mass in g/1, <i>Min</i>	Colour	General Characteristics
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Mixed										
xxi)	MEB	Mixed extra bold	-	2.0	-	2.0	Nil	7.0	435	-	Dried and mixed capsules of different varieties of <i>Elettaria cardamomum</i>
xxii)	MB	Mixed bold	-	2.0	-	2.0	Nil	6.0	415	-	
xxiii)	MS	Mixed Superior	-	3.0	-	3.0	Nil	5.0	385	-	
xxiv)	MS1	Mixed Shipment I	-	3.0	-	3.0	10.0	4.0	350	-	
xxv)	MS2	Mixed Shipment II	-	3.0	-	3.0	12.0	4.0	320	-	
xxvi)	ML	Mixed Light	-	-	-	-	15.0	3.5	260	-	

Table 4 Grade Designations of Cardamom Seeds and Their Requirements
(Clause 7.2)

Sl No.	Grade Designation	Trade Name	Extraneous Matter, Percent by Mass, <i>Max</i>	Light Seeds, Percent by Mass, <i>Max</i>	Mass in g/l, <i>Min</i>	General Characteristics
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	CS1	Prime	0.5	2.0	675	Decorticated and dry seeds of any variety of <i>Elettaria</i> <i>Cardamomum</i>
ii)	CS2	Shipment	1.0	3.0	660	
iii)	CS3	Brokens	2.0	-	-	

ANNEX A
(Table 2)

SAMPLING PLAN FOR MICROBIOLOGICAL REQUIREMENTS

C-1 SAMPLING PLAN FOR MICROBIOLOGICAL REQUIREMENTS

The terms n , c , m and M used in this standard have the following meaning:

n = Number of units comprising a sample.

c = Maximum allowable number of units having microbiological counts above m for 2- class

sampling plan and between m and M for 3- class sampling plan.

m = Microbiological limit that separates unsatisfactory from satisfactory in a 2- class sampling plan or acceptable from satisfactory in a 3-class sampling plan.

M = Microbiological limit that separates unsatisfactory from satisfactory in a 3-class sampling plan.

C-2 INTERPRETATION OF RESULTS:

<i>Sl No.</i>	<i>2-Class Sampling Plan (where n, c and m are Specified)</i>	<i>3-Class Sampling Plan (where n, c, m and M are Specified)</i>
1)	Satisfactory, if all the values observed are $\leq m$	1) Satisfactory, if all the values observed are $\leq m$
2)	Unsatisfactory, if one or more of the values observed are $> m$.	2) Acceptable, if a maximum of c values are between m and M .
		3) Unsatisfactory, if one or more of the values observed are $> M$ or more than prescribed c values are $> m$

ANNEX B
(Foreword)

COMMITTEE COMPOSITION

Spices and Condiments Sectional Committee, FAD 09

<i>Organization</i>	<i>Representative(s)</i>
Spices Board India, Kochi	DR A. B. REMA SHREE (Chairperson)
AB Mauri India Private Limited, Kochi	SHRI PRAKASH NAMBOODIRI
All India Spices Exporters Forum, Cochin	SHRI CHERIAN XAVIER SHRIMATI PRIYAMVADA NILAYANGOD (<i>Alternate</i>)
CSIR - Central Food Technological Research Institute, Mysore	DR M. MADHAVA NAIDU MR NAGARAJAN S. (<i>Alternate</i>)
CSIR - National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram	DR RAGHU K. G.
Concert Trust, Consumers Association of India, Chennai	SHRI M. R. KRISHNAN
Confederation of Indian Industry, New Delhi	MS NEHA AGGARWAL SHRI KANNAN B. (<i>Alternate</i>)
Consumer Coordination Council, Noida	SHRI RAMJI BHAI MAVANI
Defence Food Research Laboratory, Mysore	DR K. R. ANILAKUMAR SHRI DEV KUMAR YADAV (<i>Alternate</i>)
Directorate of Arecanut and Spices Development, Calicut	DR HOMEY CHERIYAN DR FEMINA (<i>Alternate</i>)
Directorate of Marketing and Inspection, Faridabad	JOINT AGRICULTURAL MARKETING ADVISER (QC) DEPUTY AGRICULTURAL MARKETING ADVISER (<i>Alternate</i>)
Export Inspection Council of India, New Delhi	SHRI WASI ASGHAR SHRI SHASHI PRAKASH TRIPATHI (<i>Alternate</i>)
Food Safety and Standards Authority of India, New Delhi	ADVISOR
ICAR - Indian Institute of Spices Research, Kozhikode	DR N. K. LEELA DR E. JAYASHREE (<i>Alternate</i>)
ICMR - National Institute of Nutrition, Hyderabad	DR S. SREENIVASA REDDY DR PARAS SHARMA (<i>Alternate</i>)
Kerala Agricultural University, Thrissur	DR SAJI GOMEZ DR SEEJA THOMACHAN PANJIKKARAN (<i>Alternate</i>)
National Institute of Food Technology Entrepreneurship and Management, Sonapat	DR SUNIL PAREEK
National Research Centre on Seed Spices, Ajmer	DR S. N. SAXENA DR B. K. MISHRA (<i>Alternate</i>)
Praveen Masalewale	SHRI ANAND CHORDIA SHRIMATI ROHINI KULKARNI (<i>Alternate</i>)

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<i>Organization</i>	<i>Representative(s)</i>
Spices Board India, Kochi	SHRI RAMESH BABU N. SHRIMATI C. M. SRI LATHA (<i>Alternate</i>)
Synthite Industries Private Limited, Kolenchery	SHRI SHUBU K. CHITHAJAN SHRI ANIL KUMAR (<i>Alternate</i>)
World Spice Organization, Kochi	SHRI RAMKUMAR MENON SHRI PHILIP KURUVILLA (<i>Alternate</i>)
BIS Directorate General	SHRIMATI SUNEETI TOTEJA, SCIENTIST 'E'/ DIRECTOR AND HEAD (FOOD AND AGRICULTURE) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretary
SHRIMATI NAVITA YADAV
SCIENTIST 'D'/JOINT DIRECTOR
(FOOD AND AGRICULTURE), BIS

Bureau of Indian Standards

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402

Website: www.bis.gov.in

Regional Offices:

	Telephones
Central : 601/A, Konnectus Tower -1, 6 th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	{ 2323 7617
Eastern : 8 th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	{ 2367 0012 2320 9474
Northern : Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	{ 265 9930
Southern : C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	{ 2254 1442 2254 1216
Western : Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	{ 2821 8093

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