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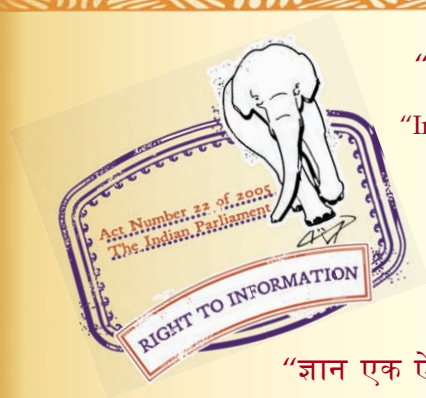
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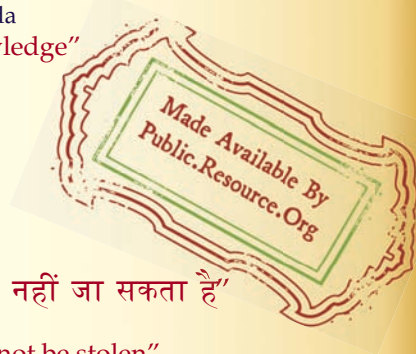
IS 2867 (1964): Canned Mangoes [FAD 10: Processed Fruits and Vegetable Products]



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Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS : 2867 - 1964

Indian Standard
**SPECIFICATION FOR
CANNED MANGOES**

REAFFIRMED

~~2005~~ 2009

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR CANNED MANGOES

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(Continued on page 2)

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(Continued from page 1)

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**AMENDMENT NO. 2 MAY 1996
TO
IS 2867 : 1964 SPECIFICATION FOR CANNED
MANGOES**

(*Page 3, Foreword, clause 0.4*) — Insert the following new clause after 0.4 and renumber the subsequent clause:

'0.5 A scheme for labelling environment friendly products known as ECO-Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act, 1986* as per the Resolution No. 71 dated 20 February 1991 and Resolution No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO-Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional environment friendly (EF) requirements. The environment friendly requirements for canned mangoes are, therefore, included through Amendment No. 2 to this standard.

This amendment is based on the Gazette Notification No. 624 (E) dated 6 September 1995 for Labelling Beverages, Infant Foods, Processed Fruits and Vegetable Products as environment friendly, published in the Gazette of the Government of India.'

(*Page 7, clause 5.5.5*) — Insert the following new clause after 5.5.5:

"5.6 Additional Requirements for ECO-Mark

5.6.1 General Requirements

5.6.1.1 The product shall conform to the requirements prescribed under 5.1 to 5.5.5.

5.6.1.2 The manufacturer shall produce the consent clearance as per the provisions of *Water (PCP) Act, 1974*, *Water (PCP) Cess Act, 1977* and *Air (PCP) Act, 1981* along with the authorization if required under *Environment (Protection) Act, 1986* and the Rules made thereunder to the Bureau of Indian Standards while applying for the ECO-Mark and the product shall also be in accordance with the *Prevention of Food Adulteration Act, 1954* and the Rules made thereunder. Additionally, *FPO 1955 (Fruit Product Order)* framed under *Essential Commodities Act, 1955*, *Standards of Weight and Measures Act, 1977* requirements wherever applicable has to be complied with.

Indian Standard

SPECIFICATION FOR CANNED MANGOES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 19 September 1964, after the draft finalized by the Fruits and Vegetables Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Canned mangoes occupy a very prominent place among the processed fruits which are exported from India. There is ample scope for the development of external as well as the internal trade. It is, however, necessary to ensure the quality of the products, if the demand is to be maintained and further developed. In order to ensure maintenance of proper quality, it is necessary to have strict quality control based on specifications. It was, therefore, found necessary to formulate an Indian Standard Specification for this product.

0.3 In the preparation of this standard, due consideration has been given to the provisions of the Prevention of Food Adulteration Act, 1954; the Prevention of Food Adulteration Rules, 1955 and the Fruit Products Order, 1955. However, this standard is subject to the restrictions imposed under these, wherever applicable.

0.4 In this standard the trade designations and the trade sizes, along with the converted metric values, of the containers as at present being used within the country have been specified. These dimensions would be revised as and when an Indian Standard for open top sanitary cans is published.

0.5 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 : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (revised).

IS : 2867 - 1964

1. SCOPE

1.1 This standard prescribes the requirements for canned mangoes, *Mangifera indica* L., in syrup.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Cut-Out Syrup — The syrup obtained after cutting open the can and draining the product.

2.2 Head Space — The distance between the top of the double seam and the level of the surface of the contents.

2.3 Absence of Defects — Freedom from extraneous materials, such as peel and stone, scraping and also freedom from damage due to mechanical injury.

2.4 Blemished Units — Processed units that are affected with some injury, such as discolouration, pathological or hail injury, and other abnormality readily visible to the naked eye to a noticeable degree.

2.5 Unit — An individual piece of different styles of canned mangoes.

3. TYPES AND STYLES

3.1 Types — The following varieties of mangoes shall be used for canning:

- a) Alphonso,
- b) Banganapalli,
- c) Dusheri,
- d) Langra, and
- e) Fazli.

3.2 Styles — The styles of canned mangoes shall be in the following forms:

- a) Two full slices obtained by cutting peeled mangoes longitudinally; and
- b) Quarters, cubes, ovals or fingers.

4. GRADES

4.1 Canned mangoes shall be of two grades, namely, Grade 1 and Grade 2.

5. REQUIREMENTS

5.1 Hygienic Requirements — The material shall be prepared and handled under strict hygienic conditions by persons free from contagious and infectious diseases and only in premises maintained in a thoroughly clean and hygienic condition and having adequate and safe water supply and duly approved and licensed by the public health authorities concerned. All workers shall use clean, white, washed clothing. Necessary precautions shall be taken to prevent incidental contamination of the product from soiled equipment or from personnel suffering from injuries.

5.1.1 All equipment coming in contact with raw materials or products in the course of manufacture shall be kept clean. An ample supply of steam and water, hose, brushes and other equipment necessary for proper cleaning of machinery and equipment shall be available. The equipment may be sterilized by immersion in, or swabbing with hypochlorite or other suitable chlorine solution (*see* IS : 2491-1963*).

5.2 General — Canned mangoes shall be prepared from ripe mangoes picked at the proper stage of maturity. Each lot shall consist of mangoes of one variety only.

5.3 Freedom from Artificial Colouring Matter, Flavouring and Synthetic Sweetening Agents — The material shall be free from artificial colouring matter and flavouring and synthetic sweetening agents.

5.4 Requirements for Covering Syrup — The covering syrup shall be clear. It shall be made from cane sugar. The only substances that may be added to the covering syrup are citric acid, ascorbic acid, and/or any legally permitted firming agent.

5.5 Requirements for the Finished Product — The contents of the can on opening shall display the following characteristics:

Grade 1 — The canned mangoes shall possess a good, characteristic, practically uniform colour; shall be practically uniform in size and symmetry; shall be practically free from defects and practically be intact; shall possess a tender fleshy texture and normal characteristic flavour and shall score not less than 85 points.

Grade 2 — The canned mangoes shall possess a good, characteristic, and reasonably uniform colour; shall be reasonably uniform in size and symmetry; shall be reasonably free from defects and reasonably be intact; shall possess a reasonably tender texture and normal characteristic flavour and shall score not less than 75 points.

*Code for sanitary conditions for food processing units.

IS : 2867 - 1964

The maximum and minimum number of points to be scored by different factors shall be as follows:

	<i>Maximum</i>	<i>Minimum</i>	
		Grade 1	Grade 2
Colour	20	15	13
Texture and uniformity of size	25	19	16
Taste and flavour	20	15	13
Absence of defects	35	26	23

Scoring shall be done according to the method prescribed in Appendix A.

5.5.1 Colour

Grade 1 — The units shall possess a good, practically uniform colour, characteristic of well-matured fruit, which means that the colour shall be bright, practically free from any discolouration due to over-ripeness, oxidation, processing or other causes.

Grade 2 — The units shall possess a good and reasonably uniform colour, which means that the colour shall be reasonably bright and characteristic of matured fruit, but may vary slightly in shades of the typical colour, and reasonably free from discolouration due to oxidation, processing or other causes.

5.5.2 Texture and Uniformity of Size

Grade 1 — The units shall possess a tender, fleshy texture, which means that the units shall be thick and fleshy, reasonably free from fibre and may be soft but not broken. They shall be uniform in size.

Grade 2 — The units shall possess a tender texture, which means that the units may be soft, but not broken or disintegrated to the extent that their normal shape is altered; they may be slightly firm indicating that fruit is reasonably mature; they shall be reasonably uniform in size and thickness.

5.5.3 Taste and Flavour

Grade 1 — The units shall possess pleasant aroma and flavour characteristic of the variety of mangoes canned. The taste shall be sweet and characteristic of the variety. The units shall be completely devoid of any objectionable or off-taste, smell or odour indicative of unripe (sour and fibrous) fruit.

Grade 2 — The units shall possess pleasant aroma and flavour characteristic of the variety of mangoes canned. The taste shall be sweet and characteristic of the variety used. The units shall be devoid of any objectionable or off-taste, and reasonably free from smell or odour indicative of unripe (sour and fibrous) fruit.

5.5.4 Absence of Defects

Grade 1 — The units shall be practically free from defects, which presumes that none of the units shall be crushed or broken; no peel shall be present, no extraneous material shall be present, not more than 5 percent by count of the units shall be blemished, no units shall be trimmed to the extent that the shape of the units is destroyed. The covering syrup shall be practically clear, practically free from cloudiness, blackening or thickening, and be practically free from fruit pulp.

Grade 2 — The units shall be reasonably free from defects, which means that none of the units shall be crushed or broken; no peel shall be present, no extraneous material shall be present, not more than 10 percent by count of the units shall be blemished. In case the units are disintegrated, the disintegrated portion shall not be more than 5 percent by weight of the drained weight. The covering syrup shall be reasonably clear, reasonably free from cloudiness, blackening or thickening and reasonably free from fruit pulp.

5.5.5 The material shall also conform to the requirements prescribed in Table 1.

6. PACKING AND MARKING

6.1 Packing

6.1.1 The material shall be packed in cans made of tinplate conforming to Charcoal Grade 2(C₂) of IS : 597-1962*, or IS : 1993-1962†. The cans shall be either plain or lacquered internally and hermetically sealed. When lacquered externally, the portion under the label, excepting the side seam, shall also be lacquered. The internal lacquer shall be acid resistant and such that it will not be destroyed, altered or its components transferred to the material inside the can during processing or subsequent storage or transport. The can exterior shall be free from dents, rust, perforations and seam distortions. The cans shall not show leaking, panelling or swell. The interior of the can shall not show any visible black discolouration, rusting or pitting and the inside lacquer shall be in good condition. Normal feathering shall not be considered as a defect.

*Specification for black plate for tinning and tin-plate (pack rolled) (revised).

†Specification for cold-reduced tinplate and cold-reduced blackplate.

TABLE 1 REQUIREMENTS FOR CANNED MANGOES

(*Clases 5.5.5 and 8.1*)

SL No.	CHARACTERISTIC	REQUIREMENT	METHODS OF TEST (REF TO CL No. OF IS : 2860-1964*)
(1)	(2)	(3)	(4)
i)	Vacuum of the can in mm, <i>Min</i>	125	5
ii)	Head space of the can in mm, <i>Max</i>	16	6
iii)	Drained weight of the contents of the can, as percentage of the net weight, <i>Min</i>	55	7
iv)	pH of cut-out syrup, <i>Max</i>	4.5	8
v)	Specific gravity of cut-out syrup (Brix)	1.07 - 1.11 (19° - 26°)	9
vi)	Acidity of cut-out syrup, as anhydrous citric acid, percent by weight, <i>Max</i>	0.3 to 0.8	10
vii)	Arsenic, ppm, <i>Max</i>	1.1	13
viii)	Lead, ppm, <i>Max</i>	2.5	14
ix)	Copper, ppm, <i>Max</i>	30	15
x)	Zinc, ppm, <i>Max</i>	19	16
xi)	Tin, ppm, <i>Max</i>	250	17
xii)	Microbiological requirements	To satisfy the requirements of the test	18

*Methods of sampling and test for processed fruits and vegetables.

6.1.2 The cans shall be filled with the fruit, without impairment of quality. The size of the cans and the net weight of their contents shall ordinarily be as given in Table 2. In case containers other than those specified in Table 2 are used, the size of the container and the net weight of the contents shall be as agreed to between the purchaser and the vendor.

6.1.3 Packing in Cases—The cans shall be packed as agreed to between the purchaser and the vendor.

6.2 Marking — Each can shall be marked with the following particulars:

- Name, type, style and grade of the material with the brand name, if any;
- Name and address of the manufacturer;
- Net weight of the contents of the can in grams;
- Date of manufacture or code number indicating the date of manufacture;
- List of additives, if used; and
- Manufacturing licence number.

TABLE 2 SIZES AND CAPACITIES OF CANS*(Clause 6.1.2)*

SL No.	CONTAINER '(TRADE NAME)	TRADE SIZE	NOMINAL DIAMETER	NOMINAL HEIGHT	NET WEIGHT OF CONTENTS
			mm	mm	g
(1)	(2)	(3)	(4)	(5)	(6)
i)	8-oz Flat	301 × 208	77·8	60·3	220
ii)	No. 1 Tall	301 × 409	77·8	115·9	454
iii)	1-lb Butter size	401 × 300	103·2	76·2	510
iv)	1-lb Jam	301 × 309	77·8	90·4	355
v)	A-2	307 × 408	87·3	114·3	570
vi)	A-2½	401 × 411	103·2	119·1	850
vii)	7-lb Jam	603 × 513	157·2	147·6	2 440
viii)	Large	509 × 703	141·3	182·6	2 850

6.2.1 Each packing case shall also be marked with the following particulars:

- a) Name of the product;
- b) Name of the manufacturer;
- c) Manufacturing licence number; and
- d) Number of cans × weight of each can.

7. SAMPLING

7.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in 3 of IS : 2860-1964*.

8. TESTS

8.1 The samples of canned mangoes shall be tested for ascertaining conformity of the material to the requirements of this specification by the methods given in IS : 2860-1964*. Reference to the relevant clauses of IS : 2860-1964* is given in col 4 of Table 1.

A P P E N D I X A

(Clause 5.5)

DETERMINATION OF GRADE OF THE PRODUCT

A-1. APPARATUS

A-1.1 White Porcelain Bowls — big enough to hold the contents of the can under examination.

A-1.2 Stainless Steel Spoons — table spoons (*see* IS : 990-1957†).

*Methods of sampling and test for processed fruits and vegetables.

†Specification for spoons, stainless steel.

A-2. PROCEDURE

A-2.1 Panel of Judges— Judging for grading the product shall be done by a panel of three to five judges. All the judges constituting the panel shall be conversant with the factors governing the quality of the product. The cans shall be opened and the contents poured separately into white porcelain bowls. Each judge shall independently examine the contents from each of the cans and assign scores for different characteristics.

A-2.1.1 The judges shall consider the following characteristics: colour texture and uniformity of size, taste and flavour, and absence of defects.

A-2.2 System of Scoring— The variations within each factor are so described that the scores may be ascertained for each factor and expressed numerically. The relative importance of each factor has been expressed numerically on a scale of 100. Each judge shall give a score for the individual factors by the method described in Table 3 (*see P 12*) and record his observations in the Score Sheet for individual Judge (*see P 14*).

A-2.2.1 The scores as number of points given on the Score Sheet by the judges for the contents of each can for the four factors shall be recorded in a tabular form in the Score Card (*see P 15*) and the average score calculated for each factor with overall average for each can entered in the appropriate column of the Score Card after complying with the conditions specified in **A-2.3.1** and **A-2.3.2**.

A-2.3 Ascertaining the Grade

A-2.3.1 Agreement Among Judges— To ascertain the consistency of judgement among the judges, the total score assigned by each of them for the contents of the same can shall be calculated by adding up the scores for the various individual characteristics. If the difference between the maximum and the minimum of the total score so obtained does not exceed $(K + 5)$, where K is the number of judges, the scoring shall be deemed as consistent for the can under consideration. If the difference exceeds $(K + 5)$, the most outlying score, that is, the one which is farthest from its immediate neighbour (the scores being arranged in one order) shall be discarded and the consistency among the remaining judges shall be examined.

A-2.3.2 When the consistency (*see A-2.3.1*) is thus established, the overall average scores given by the judges whose scoring has been found to be consistent shall be calculated for each can. The average score for each of the individual characteristics shall also be calculated by taking

into account the corresponding scores as given by the same judges for the contents of the same can.

A-2.3.3 Assignment of Grade — In order to assign a grade for the contents of a can, the following procedure shall be adopted:

For Grade 1 — The score for each factor individually shall be not less than 75 percent of the maximum score obtainable, and the overall average score shall be not less than 85 points.

For Grade 2 — The score for each factor individually shall be not less than 65 percent of the maximum score obtainable, and the overall average score shall be not less than 75 points.

TABLE 3 METHOD FOR GIVING SCORES FOR CANNED MANGOES

(Clause A-2.2)

ORGANOLEPTIC CHARACTERISTIC	REQUIREMENTS	MAXIMUM NUMBER OF POINTS	PROPERTIES WHICH REDUCE THE VALUE	POINTS REDUCING THE VALUE UP TO
(1)	(2)	(3)	(4)	(5)
Colour	Good, bright, uniform, characteristic of the variety and well-matured fruit; free from any discolouration due to over-ripeness, oxidation, proceeding or other causes	20	Not quite uniform, slightly varying shades of the characteristic colour, slight discolouration Not very bright, not very uniform, reasonably varying in the shades of characteristic colour, a little discolouration Dull, non-uniform, varying considerably in shades, discolouration (total)	15 13 0
*Texture and uniformity of size	Tender, fleshy, thick, unbroken units, not disintegrated; uniform in size	25	Not quite fleshy units, soft but not broken; just uniform size Not fleshy, just firm units indicative of reasonably mature fruit. Units slightly varying in size Firm, broken, misshapen units. Non-uniform in size	19 16 0
Taste and flavour	Pleasant aroma and flavour characteristic of the variety. Taste characteristic of the variety, free from objection-	20	Slight variation in normal flavour, slight smell indicative of unripe (sour) fruit Slightly off-taste due to metallic contamination, mildly sour smell	15 13

(Continued)

TABLE 3 METHOD FOR GIVING SCORES FOR CANNED MANGOES — *Contd*

ORGANOLEPTIC CHARACTERISTIC	REQUIREMENTS	MAXIMUM NUMBER OF POINTS	PROPERTIES WHICH REDUCE THE VALUE	POINTS REDUCING THE VALUE UP TO
(1)	(2)	(3)	(4)	(5)
	able or off-taste, smell or odour indicative of unripe (sour and fibrous) fruit. Free from staleness or metallic taste		Objectionable or off-taste, smell of staleness, or strong smell of unripe sour fruit	0
†Absence of defects	Free from defects; free from crushed, or disintegrated broken units, blemished units or extraneous material. No unit trimmed to the extent that normal shape of unit is destroyed. Covering syrup shall be clear, free from cloudiness, blackening or thickening, from pulp, etc	35	Blemished units up to 5 percent by count; syrup with stray particles of pulp Blemished units up to 10 percent by count; disintegrated portions of more than 5 percent of the drained weight; -syrup with few particles of pulp. A few broken units Blemished units more than 10 percent by count; crushed units; syrup cloudy, blackened, fruit pulp in the syrup	26 23 0

*While rating 'Texture and Uniformity of Size', texture may be allotted 15 points and uniformity of size, 10 points.

†While rating, 'Absence of Defects', a tentative maximum score of 15 points for absence of blemishes, 5 for absence of peel and core, 5 for absence of extraneous matter and 10 for clarity of covering syrup may be considered.

SCORE SHEET FOR INDIVIDUAL JUDGE

Sample No.....

Date of Sampling.....

DETAILS OF THE SAMPLE: a) Product..... b) Name of Manufacturer..... c) Type.....

d) Batch No..... e) Date of Manufacture.....

FACTORS	SCORE POINTS	SAMPLE CANS									
		1	2	3	4	5	6	7	8	9	10
Colour	Grade 1 : 15-20 Grade 2 : 13-14										
Texture and uniformity of size	Grade 1 : 19-25 Grade 2 : 16-18										
Taste and flavour	Grade 1 : 15-20 Grade 2 : 13-14										
Absence of defects	Grade 1 : 26-35 Grade 2 : 23-25										

Signature of the

Judge with Date.....

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Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002	5 36 27
53/5, Ward No. 29, R.G. Barua Road, 5th Byelane, GUWAHATI 781003	3 31 77
5-8-56C L. N. Gupta Marg (Nampally Station Road), HYDERABAD 500001	23 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302005	{ 6 34 71 6 98 32
117/418 B Sarvodaya Nagar, KANPUR 208005	{ 21 68 76 21 82 92
Patliputra Industrial Estate, PATNA 800013	6 23 06
T.C. No. 14/1421, University P.O., Palayam TRIVANDRUM 695035	{ 6 21 04 6 21 17

Inspection Offices (With Sale Point):

Pushpanjali, First Floor, 205-A West High Court Road, Shankar Nagar Square, NAGPUR 440010	2 51 71
Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 35

*Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072

†Sales Office in Bombay is at Novelty Chambers, Grant Road, 89 65 28
Bombay 400007

‡Sales Office in Bangalore is at Unity Building, Narasimharaja Square, 22 36 71
Bangalore 560002

Reprography Unit, BIS, New Delhi, India