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Indian Standard

SPECIFICATION FOR PRAWNS/SHRIMP CANNED IN BRINE

(First Revision)

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INDIAN STANDARDS INSTITUTION
MANAK BHAYAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 1

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Indian Standard

SPECIFICATION FOR PRAWNS/SHRIMP CANNED IN BRINE (*First Revision*)

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Indian Standard
SPECIFICATION FOR
PRAWNS/SHRIMP CANNED IN BRINE
(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 4 October 1968, after the draft finalized by the Fish and Fisheries Products Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Canned prawns is an important export commodity of this country. There is ample scope for the development of the external as well as the internal trade in this commodity if proper quality control measures are taken.

0.3 In the process of canning prawns, the fresh material is first peeled; removing the heads, shells and viscera or the 'venis'. The material is then cleaned thoroughly with water and the slime is removed. It is then blanched, graded for size and filled in cans with brine and the cans are exhausted and sealed. The sealed cans are processed by heating to ensure thorough cooking and sterilization of the material.

0.4 This standard was originally issued in 1962. In the light of the experience gained by the industry, it has become imperative to make certain modifications and additions in this standard, such as (a) more precise description of the grades by specifying the count of smaller sizes of prawns, (b) inclusion of monosodium glutamate as a permissible additive, (c) revision of the limits of acidity of brine as citric acid percent (*w/v*) (0.06 to 0.2 instead of 0.2 *Max*) and parts per million of copper (10 instead of 20), and (d) drained weight requirement, as percentage by weight of the water capacity of the can instead of drained weight of the contents of the can as percentage of net weight. It is hoped that this revised standard would lead to better quality control of the product.

0.5 In the preparation of this standard, due consideration has been given to the provisions of the Prevention of Food Adulteration Act, 1954 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under this Act, wherever applicable.

0.6 This standard contains clauses **3.1**, **4.4.9** [Item (iii) in Table 1], **5.1.1.1**, **5.1.2**, **5.2**, **5.2.1**, **5.2.2** and **E-1.2** which call for an agreement between the purchaser and the vendor at the time of placing orders.

0.7 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.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for prawns/shrimp canned in brine.

2. TERMINOLOGY

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

2.1 Blanching — Heating the prawns in boiling brine for an adequate period so that the material is curled and attains the characteristic colour and flavour and a firm texture.

2.2 Count — Number of prawns per 100 g on the basis of drained weight.

3. GRADES

3.1 Unless agreed otherwise between the purchaser and the vendor, the material shall be of 8 grades, namely, Colossal/Supreme Jumbo, Jumbo, Large, Medium, Small, Tiny, Cocktail/Mini/Salad and Broken and these grades shall be on the basis of the count as follows:

<i>Grade Designation</i>	<i>Count/100 g</i>	<i>Abbreviation</i>
Colossal/Supreme Jumbo	Up to 8	C/SJ
Jumbo	9 „ 13	J
Large	14 „ 22	L
Medium	23 „ 36	M
Small	37 „ 63	S
Tiny	64 „ 102	T
Cocktail/Mini/Salad	103 and above	CT/MI/SD
Broken (Whole and Broken)	Not limit	B/WB

3.2 Any pack showing broken pieces more than 10 percent by weight irrespective of the number of pieces present in the can shall be declared as Broken.

*Rules for rounding off numerical values (*revised*).

3.2.1 Any piece showing less than 4 segments shall be treated as Broken.

3.3 Any sample shall contain not less than ninety percent of the pieces of the declared size grade.

4. REQUIREMENTS

4.1 Hygienic Requirements — The material shall be prepared, filled and processed under hygienic conditions and only in premises maintained in a thoroughly clean and hygienic manner [see IS : 4303 (Part II)-1967*] and duly approved or licensed by the authorities concerned.

4.2 Raw Materials

4.2.1 The raw material used for preparation of prawns/shrimp canned in brine shall be fresh or frozen, sound, wholesome, properly cleaned and free from entrails.

4.2.2 Only refined salt conforming to IS : 594-1962† shall be used.

4.3 Preparation and Processing

4.3.1 The prawns shall be peeled, removing the heads, shells and ' veins ' or viscera before canning. They shall be washed repeatedly in clean running water free from viable pathogenic organisms until all the surface slime is removed.

4.3.2 The clean prawns shall be properly blanched using edible common salt of a quality suitable for canning. The blanched prawns shall be cooled, further dressed and freed from all loose particles of flesh, graded and filled in clean cans along with brine. Very small quantities of monosodium glutamate, citric and, acetic acid or tartaric acid may be added.

4.3.3 The cans shall be exhausted by heat, steam or mechanical process and sealed in hot condition by double seaming. The sealed cans shall be processed at such temperature and for such length of time as will ensure thorough cooking and adequate sterilization of the finished product without burning, scorching or overcooking. Water used for the cooling of cans shall be maintained in clean condition and chlorinated to maintain a minimum residual chlorine concentration of one part per million.

4.4 Requirements for the Finished Products

4.4.1 The contents of the can on opening shall present a good appearance and shall not display any appreciable disintegration. Pieces from which

*Code for sanitary conditions, handling and transport in fish industry: Part II Sanitary conditions for fish processing units.

†Specification for common salt for fish curing.

portions have separated out shall be treated as disintegrated units. The proportion of disintegrated portions of prawns, calculated on the basis of the drained weight, shall not exceed 5 percent, by weight, based on the average of 5 cans.

4.4.2 The surface of the prawns shall not appear slimy to the touch. The meat shall be soft but firm and shall not crumble to granular form when pressed between the fingers.

4.4.3 The prawn pieces shall not be pressed together and it should be possible to separate the pieces easily. The pieces shall be of uniform size and shall be clean and free from loose hanging pieces of meat.

4.4.4 The brine shall be clear and not discoloured and shall not jell when stored at low temperature (about 4°C).

4.4.5 The material shall have the odour and flavour of freshly caught and cooked prawn meat and shall be free from any undesirable odour. The material shall be free from scorched, bitter or any objectionable flavour.

4.4.6 The material shall be free from a pale or bleached colour with a greenish-yellow tint indicative of pre-processed spoilage or a deep red colouration indicative of post-processed spoilage. The material shall be free from any black discolouration.

4.4.7 The material shall be free from dirt, insect or hair or other extraneous matter. It shall be free from bits of veins, shell particles and pieces of appendages.

4.4.8 The material shall be free from any poisonous and deleterious substances.

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

5. PACKING AND MARKING

5.1 Packing

5.1.1 Packing in Cans — The material shall be packed in suitable internally and uniformly lacquered cans and the cans sealed hermetically. The lacquer used shall be such that it does not impart any foreign unpleasant taste and smell to the contents of the can and does not peel off during processing and storage. The lacquer shall not be soluble in brine to any extent. The can exterior shall be free from major dents, rust, perforations and seam distortions. The cans shall not show leaking, panelling or swell. The interior of the can on opening shall not show any visible black discolouration, rusting or pitting and the inside lacquer shall be in good condition.

TABLE 1 REQUIREMENT FOR PRAWNS/SHRIMP CANNED IN BRINE
(Clause 4.4.9)

SL No.	CHARACTERISTIC	REQUIREMENT	METHODS OF TEST, REF TO	
			Appendix	Appendix in IS : 2168-1962*
(1)	(2)	(3)	(4)	(5)
i)	Vacuum of the can in mm, <i>Min</i>	100	A	—
ii)	Head space of the can in mm	5.0 to 7.5	—	B
iii)	Drained weight of the contents of the can, as percentage by weight of the water capacity of the can, <i>Min</i>	64†	B	—
iv)	Sodium chloride in brine, percent (<i>w/v</i>), <i>Max</i>	3.5	C	—
v)	Acidity of brine as citric acid (anhydrous), percent (<i>w/v</i>)	0.06 to 0.20	D	—
vi)	Arsenic, parts per million, <i>Max</i>	1	—	C
vii)	Lead, parts per million, <i>Max</i>	5	—	D
viii)	Copper, parts per million, <i>Max</i>	10	—	E
ix)	Zinc, parts per million, <i>Max</i>	50	—	F
x)	Tin, parts per million, <i>Max</i>	250	—	G
xi)	Bacteriological requirements	To satisfy the test	—	H

*Specification for pomfret canned in oil.

†Or as agreed to between the purchaser and the vendor.

5.1.1.1 The cans may also be lacquered externally subject to agreement between the purchaser and the vendor. .

5.1.2 Packing in Cases — Unless agreed otherwise between the purchaser and the vendor, the cans shall be packed in cases, strong enough to withstand rough handling by rail, road or sea-transport without damage to the contents. The number of cans in each case shall be as agreed to between the purchaser and the vendor.

5.2 Marking — The labelling of the cans shall be done by printing or lithographing on the cans themselves or by attaching labels printed on paper, subject to agreement between the purchaser and the vendor.

5.2.1 The labels shall give the following information:

- Name and grade of the material with the brand name, if any;
- Name and address of the manufacturer (optional for export purposes);

- c) Minimum net weight of the contents of the can in grams (and also in ounces, if required by the purchaser) — optional for export purposes;
- d) Drained weight of the contents of the can in grams (and also in ounces, if required by the purchaser) — optional for export purposes;
- e) Batch or lot number and the date of manufacture in code to be embossed on the can;
- f) List of additives added; and
- g) Licence number, if any, under which the manufacturer has been permitted to can the material.

5.2.2 The warranty period may also be mentioned on the label subject to agreement between the purchaser and the vendor.

5.2.3 Each can may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. SAMPLING

6.1 The method of drawing representative samples of the material for tests and the criteria for conformity shall be according to the method prescribed in Appendix E.

7. TESTS

7.1 Tests shall be carried out as prescribed in the relevant appendices in this specification as well as in IS : 2168-1962* as specified in col 4 and 5 of Table 1.

7.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1960†) shall be used in tests.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the experimental results.

*Specification for pomfrets canned in oil.

†Specification for water, distilled quality (*revised*).

APPENDIX A

[Table 1, Item (i)]

DETERMINATION OF VACUUM OF CANS

A-1. The vacuum in the cans may be determined with a vacuum gauge of the piercing type or of an electric recording type.

APPENDIX B

[Table 1, Item (iii)]

DETERMINATION OF DRAINED WEIGHT

B-1. APPARATUS

B-1.1 IS Sieve 200 (Aperture 2.00 mm) — Alternatively, use BS Sieve 8 or Tyler Sieve 9 or ASA Sieve 10 (same as ASTM Test Sieve) (*see* IS : 460-1962*).

B-2. PROCEDURE

B-2.1 Carefully weigh the clean and dry sieve and transfer the contents of the can to the sieve. Allow to drain for five minutes and weigh the sieve with the contents. The difference between the two weights gives the drained weight. Calculate the drained weight as percentage of the water capacity of the can. Retain the residue on the sieve as well as the drained liquid and also the can for preparing the solution for the estimation of sodium chloride in the brine (*see* **C-2.1**).

B-2.2 Determine the water capacity of the can by the procedure given in **B-2.2.1** to **B-2.2.4**.

B-2.2.1 Cut out the lid without removing or altering the height of the double seam.

B-2.2.2 Wash, dry and weigh the empty can.

B-2.2.3 Fill the container with distilled water at 20°C to 4 mm vertical distance below the top level of the container and weigh.

B-2.2.4 Subtract the weight in **B-2.2.2** from the weight in **B-2.2.3**. The difference shall be considered to be the weight of water required to fill the container.

*Specification for test sieves (*revised*).

APPENDIX C

[Table 1, Item (iv)]

DETERMINATION OF SODIUM CHLORIDE IN BRINE

C-1. REAGENTS

C-1.1 Standard Silver Nitrate Solution — 0.1 N.**C-1.2 Dilute Nitric Acid** — (1 : 4) freed from lower oxides of nitrogen by boiling till colourless.**C-1.3 Ferric Alum Indicator Solution** — a saturated solution of ferric alum [$\text{FeNH}_4(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$].**C-1.4 Standard Ammonium Thiocyanate Solution** — 0.1 N.

C-2. PROCEDURE

C-2.1 Preparation of the Solution — Wash the emptied can thoroughly with water and wash the residue on the sieve (see **B-2.1**) at least thrice with cold water. Collect the drained liquid (see **B-2.1**) and all the washings together in a 1 000-ml graduated flask and make up the volume. Centrifuge the made-up liquid for at least five minutes at 1 000 rev/min.**C-2.2** Take a suitable aliquot of the clear supernatant solution prepared as in **C-2.1**, add a known volume of the standard silver nitrate solution in slight excess and then add 20 ml of dilute nitric acid. Boil gently on a hot-plate or a sand-bath until all solids except silver chloride dissolve (usually 15 minutes). Cool, add 50 ml of water and 5 ml of the ferric alum indicator solution and titrate with the standard ammonium thiocyanate solution until permanent light brown colour appears.

C-3. CALCULATION

C-3.1 Sodium chloride in the brine,
percent by weight
$$= \frac{5.85 (V_1 N_1 - V_2 N_2)}{W}$$

where

 V_1 = volume in ml of the standard silver nitrate solution added, N_1 = normality of the standard silver nitrate solution, V_2 = volume in ml of the standard ammonium thiocyanate solution used, N_2 = normality of the standard ammonium thiocyanate used, and W = weight in g of the brine in the aliquot.

NOTE — The total weight of brine is obtained by finding the difference between the net weight and the drained weight of the contents of the can.

APPENDIX D

[Table 1, Item (v)]

DETERMINATION OF ACIDITY OF BRINE

D-1. REAGENTS

D-1.1 Standard Sodium Hydroxide Solution — 0.1 N.

D-1.2 Phenolphthalein Indicator Solution — Dissolve one gram of phenolphthalein in 100 ml of 95 percent (w/v) alcohol (*see* IS : 321-1952*).

D-2. PROCEDURE

D-2.1 Take a suitable aliquot of the brine solution (*see* C-2.1), add about 200 ml of water and titrate against the standard sodium hydroxide solution using phenolphthalein indicator solution. Calculate the percentage acidity of the brine in terms of citric acid from the relationship : 1 ml of 0.1 N sodium hydroxide solution is equivalent to 0.006 4 g of citric acid (anhydrous).

APPENDIX E

(Clause 6.1)

SAMPLING OF PRAWNS/SHRIMP CANNED IN BRINE

E-1. GENERAL REQUIREMENTS OF SAMPLING

E-1.1 Samples shall be stored in such a manner, that the temperature of the material does not vary unduly from the normal temperature.

E-1.2 Samples shall be tested at a laboratory agreed to between the purchaser and the vendor.

E-2. SCALE OF SAMPLING

E-2.1 Lot — All the cases containing cans of the same size and grade of prawns shall be grouped together to constitute a lot.

E-2.1.1 Samples shall be tested for each lot for ascertaining the conformity of the material to the requirements of this specification.

E-2.2 The number of cases to be selected from each lot shall be in accordance with col 1 and 2 of Table 2.

*Specification for ethyl alcohol (absolute alcohol).

TABLE 2 SELECTION OF PACKING CASES

(Clause E-2.2)

NO. OF CASES IN THE LOT	NO. OF CASES TO BE SELECTED
(<i>N</i>)	(<i>n</i>)
(1)	(2)
Up to 8	2
9 „ 25	4
26 „ 40	5
41 „ 65	6
66 „ 110	7
111 „ 180	8
181 „ 300	9
301 and above	10

E-2.3 These packing cases shall be selected at random. In order to ensure randomness of selection, random number tables shall be used. If such tables are not available, the following procedure may be adopted:

Starting from any case count them as 1, 2, 3,.....*r* in a systematic manner. Every *r*th case thus counted shall be withdrawn, *r* being the integral part of N/n , where *N* is the total number of cases in the lot and *n* the number of cases to be selected.

E-2.4 From each of the cases selected as in **E-2.2**, draw at random two cans for testing the physical and chemical requirements prescribed in Table 1.

E-2.5 In addition to the cans selected as in **E-2.4**, select a total of 8 cans at random from the different cases selected (*see* **E-2.2**) for testing the microbiological requirements.

E-3. TESTING OF SAMPLES

E-3.1 Each of the cans, selected as in **E-2.4**, for testing the physical and chemical requirements, shall be tested individually for vacuum and head space.

E-3.2 After testing for vacuum and head space, half of the cans shall be tested individually for drained weight, sodium chloride content in brine and acidity of brine, while the contents of all the remaining cans shall be mixed to form a composite sample and the composite sample so formed shall be tested for arsenic, lead, copper, zinc and tin.

E-3.3 Tests for Bacteriological Requirements

E-3.3.1 Incubation at 37°C — Half of the cans selected as in **E-2.5** shall be incubated at 37°C for not less than 14 days and subjected to bacteriological examination.

E-3.3.2 Incubation at 55°C — The remaining half of the cans shall be incubated at 55°C for not less than 14 days and subjected to bacteriological examination.

E-4. CRITERIA FOR CONFORMITY

E-4.1 Vacuum and Head Space Requirements — The lot shall be declared as conforming to the requirements for vacuum and head space when each of the cans tested individually (*see E-3.1*) satisfies the requirements specified in Table 1.

E-4.2 Drained Weight, Sodium Chloride in Brine and Acidity of Brine — The test results for these characteristics for each of the cans tested (*see E-3.2*) shall satisfy the requirements prescribed in Table 1.

E-4.3 Metallic Impurities — The test results for metallic impurities on the composite sample (*see E-3.2*) shall satisfy the requirements prescribed for arsenic, lead, copper, zinc and tin in Table 1.

E-4.4 Microbiological Requirements — For declaring the conformity of the lot to the microbiological requirements, the test results (*see E-3.3.1* and *E-3.3.2*) shall satisfy the requirements prescribed in Table 1.

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