PM/ 899/1
August 2020

PRODUCT MANUAL
FOR TAPIOCA SAGO (SABOODANA)
ACCORDING TO IS 899 : 1971

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	**Product**	:	IS 899 : 1971
	Title	:	TAPIOCA SAGO (SABOODANA)
	No. of Amendments	:	02
2.	**Sampling Guidelines:**		
a)	Raw material	:	No specific requirements
b)	Grouping guidelines	:	NA
c)	Sample Size	:	100 g
3.	**List of Test Equipment**	:	ANNEX - A
4.	**Scheme of Inspection and Testing**	:	ANNEX - B
5.	**Possible tests in a day :**		
	i. Visual Examination of Raw Material ii. Description iii. Dirt & Other Extraneous Matter iv. Moisture v. Total Ash (dry basis) vi. Starch (dry basis) vii. Crude Fibre (dry basis) viii. pH of Aqueous Extract ix. Colour x. Hydrocyanic Acid		
6.	**Scope of the Licence :**		
	Licence is granted to use Standard Mark as per IS 899 : 1971 with the following scope:		
	Name of the product	Tapioca Sago (Saboodana)	

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ANNEX-A

TO PRODUCT MANUAL
FOR TAPIOCA SAGO (SABOODANA)
ACCORDING TO IS 899 : 1971

LIST OF TEST EQUIPMENTS

Major test equipment required to test as per the Indian Standard

Sl No.	Tests used in with Clause Reference	Test Equipment
1.	Gelatinization Cl 3.4 (Appendix A of IS 899)	Analytical Balance, 200ml Conical Flask, Measuring Jar, Water Cooled Condenser, Wire Gauge, Heating Mantle, Bunsen burner, 850 micron IS sieve, porcelain dish, water bath, hot air oven-capable of operating at 110+2^{o}C.
2.	Moisture Cl 3.5 & Table 1 (Cl 4 of IS 4706 Part 2)	**Method I:** Hot air oven-capable of operating at 100 to 110°C, wide mouth glass weighting bottle, Desiccator, Analytical balance. **Method II (Oven Drying Method):** Metal dish, Electrical oven- capable of operating at 130 to 130 ^{o}C, Analytical balance, weighing dish.
3.	Total ash Cl 3.5 & Table 1 (Cl 5 of IS 4706 Part 2)	Analytical balance, Platinum or porcelain or silica dish, burner, muffle furnace-capable of operating at 550 $\pm$ 25°C.
4.	Acid insoluble ash Cl 3.5 & Table 1 (Cl 8 of IS 4706 Part 2)	Concentrated hydrochloric acid, watch glass, Wattman Filter paper number 42, muffler furnace-capable of operating at 550 $\pm$ 20°C, hot air oven-capable of operating at 105 to 110°C.
5.	Starch Cl 3.5 & Table 1 Cl 9 of IS 4706 Part 2	**Acid hydrolysis method:** Ethyl ether , Ethyl alcohol, dilute hydrochloric acid, sodium carbonate solution, stock solution of dextrose, standard dextrose solution, methylene blue indicator solution, Fehling's solution (Soxhlet modification), Copper Sulphate, Rochelle Salt, Sodium Hydroxide, Burette, Filter Paper, Reflux Condenser.
6.	Sulphur dioxide Cl 3.5 & Table 1 (Cl 11 of IS 4706 Part 2)	**Method I (Referee method):** Hydrogen peroxide, sulphuric acid, sodium hydroxide solution, , sulphur dioxide apparatus, boiling flask, gas inlet tube, dropping funnel, delivery tube, receiver, gas-washing bottle, burette, carbon dioxide, concentrated hydrochloric acid, sodium carbonate solution, hydrogen peroxide, standard sodium hydroxide solution, bromophenol blue indicator. **Method II (Routine method):** Sulphuric acid, sodium hydroxide, iodine solution, starch solution indicator, distilled water
7.	Crude fibre Cl 3.5 & Table 1 (Cl 12 of IS 4706 Part 2)	Dilute sulphuric acid, Sodium Hydroxide Solution, Petroleum ether, Soxhlet apparatus, reflux condenser, filtering cloth, Gooch Crucible, Ignited Asbestos

8.	pH of aqueous extract Cl 3.5 & Table 1 (Cl 13 of IS 4706 Part 2)	Electrodes and potentiometric equipment, conical flask, buffer solutions (4.5 to 7), Analytical balance.
9.	Colour of gelatinized alkaline paste Cl 3.5 & Table 1 (Appendix B IS 899)	Lovibond tintometer, porcelain cuvette, reagent, Sodium Hydroxide Solution, Carbon Tetrachloride, Analytical balance.
10.	Hydrocyanic Acid Cl 3.5 & Table 1 (Appendix C IS 899)	Mechanical grinding mill, Sieve with 1 mm aperture, weighing balance, volumetric flask, pipette 100 ml capacity, steam distillation apparatus, Sodium Hydroxide ,Ammonia, Potassium Iodide Solution, Silver Nitrate Standard Solution, Linamarase solution, Distillation Apparatus.
11.	Preparation of material Cl 6.3 of IS 899	Mortar and Pestle, Weighing Balance, 250 Micron IS Sieve, Stopper Glass Bottle.

The list above is indicative only and may not be treated as exhaustive

ANNEX B
SCHEME OF INSPECTION AND INSPECTION FOR TAPIOCA SAGO (SABOODANA) ACCORDING TO IS 899 : 1971

1. LABORATORY- A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipment.

2. TEST RECORDS- The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. PACKING AND MARKING- The Standard Mark as given in Schedule of the licence shall be stenciled/printed on each container of Tapioca Sago (Saboodana)or printed on the labels applied to the container, as the case may be, provided always that the material in each container to which this mark is thus applied conforms to every requirement of the specification.

3.1 Packing and Marking shall be done as per the provision of the Indian Standard. In addition, the following details shall be mentioned on each container legibly and indelibly:

a) BIS Licence No. CM/L_____.
b) BIS website details i.e – "For details of BIS Certification please visit www.bis.gov.in"

4. CONTROL UNIT- For the purpose of this Scheme, the entire quantity of Tapioca Sago (Saboodana) manufactured in a day shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

5.2 On the basis of tests and analysis results, the decision regarding conformity or otherwise of a control unit shall be taken as follows:

5.2.1 A sample shall be drawn every hour and checked visually for appearance, colour, freedom from fermented or musty or any other objectionable odours, adulterants, fungal contamination and insect infestation; and examined for dirt and other suspended and extraneous matter as per the method given in clause 3.3 of IS 899. Thus sample shall satisfy

the requirements given in 3.1 and 3.3 of IS 899. If the sample fails in any one or more of these requirements, the material manufactured during one hour prior to the drawl of the sample shall not be marked and be either rejected or re-processed for conformity to these requirements of the specification.

5.2.2 One sample shall be tested from each control unit before packing and tested for Gelatinization, Moisture, Total ash, Acid insoluble ash, Starch, Sulphur di oxide, Crude fibre and pH of aqueous extract. If the sample fails in any one or more of these requirements as given in the specification, the entire material in the control unit shall not be marked. The material may, however, be reprocessed and the defect(s) rectified. Such re-processed material when tested again shall conform to all the requirements of the specification.

5.2.3 Two sample from every seventh control unit (starting from a control unit chosen at random) shall be tested for Colour on Lovibond scale. If any one or both the samples fail to satisfy the requirements, the corresponding control unit, shall not be marked. The material in the control unit may, however, be reprocessed and the defect(s) rectified. Such re-processed material when tested again shall conform to all the requirements of the specification. Two samples from every subsequent control unit shall be tested for Clour on Lovibond scale until seven consecutive control units are found meeting the specification requirement, whereupon the original frequency of testing may be resumed.

5.2.4 One sample in a month shall be tested for Hydrocyanic acid. In case of failure of any sample, the corresponding control unit shall not be marked, the same may however be reprocessed and the defect(s) rectified. Two samples from subsequent two batches shall be tested. The original frequency shall be resumed in case they are found meeting the requirements.

6. RAW MATERIAL – Tapioca Sago shall be made from Starch obtained from sound tubers of tapioca, free from any fungal or bacterial contamination. Routine visual analysis of each consignment of the raw materials, received in the factory, shall be carried out and record shall be maintained.

7. **HYGEINIC CONDITIONS** - Tapioca Sago shall be manufactured, packed and stored under hygienic conditions and the manufacturing premises shall be maintained in a thoroughly clean and hygienic manner. All workers shall use clean, washed clothing, including head-covers, incidental contamination of the product from solid equipment or from personnel suffering from injuries, eruptions or boils shall be avoided. The sanitary conditions prescribed in IS 2491 (Food Hygiene-General Principles-Code of practice) shall be followed in the processing units.

8. REJECTION- Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1
LEVELS OF CONTROL

(1)				(2)	(3)		
Test Details				**Test equipment requirement R:required (or) S: Sub-contracting permitted**	**Levels of Control**		
Clause	**Requirements**	**Test Method Cl. Ref.**	**Test Method IS**		**No. of Samples**	**Frequency**	**Remarks**
3.2	Visual Examination of Raw Material	3.2	IS 899	R	One	Every Consignment	See cl 6 of SIT
3.1	Description	3.1	IS 899	R	-do-	Every Hour	See cl 5.2.1 of SIT
3.3	Dirt & Other Extraneous Matter	6	IS 4706 (Part 1)	R	-do-	-do-	-do-
3.4	Gelatinization	6 and Appendix A	IS 899	R	-do-	Each Control Unit	See cl 5.2.2 of SIT
3.5 & Table 1	Moisture	4	IS 4706 (Part 2)	R	-do-	-do-	-do-
-do-	Total Ash	5	-do-	R	-do-	-do-	-do-
-do-	Acid Insoluble Ash	8	-do-	R	-do-	-do-	-do-
-do-	Starch	9	-do-	R	-do-	-do-	-do-
-do-	Sulphur Dioxide	11	-do-	R	-do-	-do-	-do-
-do-	Crude Fibre	12	-do-	R	-do-	-do-	-do-
-do-	pH of Aqueous Extract	13	-do-	R	-do-	-do-	-do-
-do-	Colour	Appendix B	IS 899	R	-do-	Every 7th Control Unit	See cl 5.2.3 of SIT
-do-	Hydrocyanic Acid	Appendix C	IS 899	S	-do-	Once in a month	See cl 5.2.4 of SIT

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

Note-3: In case the production is started after the shutdown of the plant, for more than a week time for any reason, it shall be ensured, before packing and dispatching the material with Standard Mark, that the material is tested and found for conforming to all the requirements of the specification.