



**PRODUCT MANUAL
FOR SODIUM ALGINATE, FOOD GRADE
ACCORDING TO IS 5191 : 1993**

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 5191 : 1993
	Title	:	Sodium Alginate, Food Grade
	No. of Amendments	:	02
2.	Sampling Guidelines:		
a)	Raw material	:	No specific requirements
b)	Grouping guidelines	:	NA (No varieties for the product mentioned in IS)
c)	Sample Size	:	500 g
3.	List of Test Equipment	:	Please refer ANNEX – <u>A</u>
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – <u>B</u>
5.	Possible tests in a day:		
	i. Description ii. Identification test iii. Mater insoluble in water iv. Purity v. Ash vi. Acid insoluble ash vii. Heavy metal (as Pb)		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS 5191 : 1993 with the following scope:		
	Name of the product	:	Sodium Alginate, Food grade

ANNEX – A
TO PRODUCT MANUAL
FOR SODIUM ALGINATE, FOOD GRADE
ACCORDING TO IS 5191 : 1993

LIST OF TEST EQUIPMENT

Major test equipment required to test as per the Indian Standard

Sl. No.	Test Equipment	Tests used in with Clause Reference
1.	Electronic Weighing Balance, Ethanol, Ether, Chloroform, Naphthoresorcinol in ethanol, Concentrated Hydrochloric acid, Isopropyl ether, Ferric sulphate solution, Dilute acetic acid solution, Sodium Hydroxide Solution, Ammonium sulphate, Calcium Chloride Test tubes, Water bath (for boiling), Cooling arrangement (to maintain temperature of 15 °C), Separating funnel.	Identification Tests Clause 3.2
2.	Apparatus for determination of purity as fig 1 of IS 5191, Electronic Weighing Balance (Least count 0.001g), Oven (to maintain temperature of 105 and 145 °C, Least count 1 °C), Burette, Pipette. Hydrochloric acid-19%, Phosphoric acid-syrupy, Sodium Hydroxide solution – 0.25 N, Butanol, Barium Chloride solution -1 : 10, Phenolphthalein solution-1 %, Hydrochloric acid-0.1N.	Purity Cl 3.3, Table 1 (Annex A of IS 5191)
3.	Electronic Weighing Balance, Oven (to maintain temperature of 105 and 145 °C, Least count 1 °C), Weighing bottle, Desiccator with silica gel,	Moisture Cl 3.3, Table 1 (Annex B of IS 5191)
4.	Electronic Weighing Balance, Beaker-600 ml, Sodium Hydroxide-0.1 N, Hot air oven (to maintain temperature of 105 °C, Hot plate, Desiccator, Gooch crucible fitted with an asbestos pad.	Matter insoluble in water Cl 3.3, Table 1 (A-3 of IS 7928)
5.	Brookfield viscometer-type LVF or equivalent, Mechanical stirrer, Constant temperature bath (to maintain temperature of 25 °C), Electronic Weighing Balance, Oven (to maintain temperature of 105 and 145 °C, Least count 1 °C), Weighing bottle, Desiccator	Viscosity of 1 % solution Cl 3.3, Table 1 (Annex C of IS 5191)

6.	Electronic Weighing Balance, Oven (to maintain temperature of 105 and 145 °C, Least count 1 °C), Weighing bottle, Desiccator, Crucible, Muffle Furnace.	Ash (on dry basis) Cl 3.3, Table 1 (A-4 of IS 7928)
7.	Electronic Weighing Balance, Oven (to maintain temperature of 105 and 145 °C, Least count 1 °C), Weighing bottle, Desiccator, Crucible, Dilute Hydrochloric acid, Gooch crucible or Ash less filter paper, Hot plate or water bath.	Acid insoluble ash (on dry basis) Cl 3.3, Table 1 (A-5 of IS 7928)
8.	Digestion funnel, Separatory funnel, Nitric acid-65 %, Sulphuric acid- sp gr 1.84, Ammonium acetate-citrate solution, Ammonia solution, Carbon tetra chloride, Potassium cyanide, Hydroxylamine hydrochloride solution, Dithizone solution, buffer pH 2, Electronic Weighing Balance (Least count 0.1g), Nessler tube (50 ml), Burette, Pipette.	Lead (as Pb) Cl 3.3, Table 1 (15.2 of IS 1699)
9.	Distillation apparatus, Sulphuric acid- sp gr 1.84, Potassium permanganate solution -0.1 N, Ferrous sulphate, Hydrochloric acid -38 %, Potassium bromide solution – 20 %, Aluminium strips 8 mm x8 mmx 1mm, Tin chloride solution, test paper, Micro burner, Water bath (to maintain 25 to 30 °C)	Arsenic (as As) Cl 3.3, Table 1 (15.2 of IS 1699)
10.	Electronic Weighing Balance, Nessler tube, Crucible, Hot plate / Heating mental, Muffle furnace (to maintain temperature of 500 and 600 °C), Ammonia solution-28 %, Hydrochloric acid-10 %, Lead Nitrate stock solution, Standard lead solution, Nitric acid -10 % (v/v), Sulphuric acid – 94.5 to 95.5 % (v/v), Acetic acid-6 5 (m/v), Hydrogen sulphide, pH meter or litmus paper, Crucible,	Heavy metals (as Pb) Cl 3.3, Table 1 (A-6 of IS 7928)
11.	Incubator capable of maintaining 37 °C, Incubator capable of maintaining 44 °C (for test for growth with acid and gas production in MacConkey broth), Glass tubes open at both ends (for motility test), Seitz filtration assembly (for sterilizing solution of urea for preparing medium for urease test), Durham’s fermentation tubes (for carbohydrate fermentation test), Microscope and Glass slides (for Gram Staining. Nutrient Broth, MacConkey Broth Medium, MacConkey Agar Medium, Eosin Methylene Blue Lactose Agar	E. Coli Cl 3.3, Table 1 {IS 5887 (Part 1)}

	Medium, Tergitol-7 Agar Medium, Nutrient Agar Medium for motility test, TSI Medium for H ₂ S test, Medium for Ureas test, Medium for Indole production, Medium for Methyl red and Voges-Proskauer tests, Simmon's Citrate Agar, Peptone water medium for carbohydrate fermentation tests.	
12.	<p>Drying cabinet or oven, ventilated by convection, capable of operating between 37 °C ± 1 °C and 55 °C ± 1 °C. Incubator, capable of operating at 35 °C ± 1 °C or 37 °C ± 1 °C, depending on the temperature agreed, Water bath, capable of operating at 42 °C ± 1 °C or incubator, capable of operating at 42 °C ± 0.5 °C, Water baths, capable of operating at 45 °C &- 1 °C, 55 °C ± 1 °C and 70 °C ± 1 °C, Water bath, capable of operating at 35 °C ± 1 °C or 37 °C ± 1 °C, depending on the temperature agreed, Loops, made of platinum/iridium or nickel/ chromium, of diameter approximately 3 mm, pH-meter, having an accuracy of calibration of f 0.1 pH unit at 25 °C, Culture bottles or flasks, Culture tubes, 8 mm in diameter and 160 mm in length, Measuring cylinders, Graduated pipettes, of nominal capacities 10 ml and 1 ml, graduated respectively in 0,5 ml and 0,1 ml divisions, Petri dishes, of small size (diameter 90 mm to 100 mm) and/or large size (diameter 140 mm).</p> <p>Non-selective pre-enrichment medium: Buffered peptone water, first-selective enrichment medium: Rappaport-Vassiadis magnesium chloride/malachite green medium (RV medium), second selective enrichment medium: selenite/cystine medium, solid selective plating-out media, first medium: Phenol red/brilliant green agar, second medium, nutrient agar, triple sugar, iron agar, urea agar, L-Lysine decarboxylation medium, Reagent for detection of β-galactosidase, Reagents for Voges-Proskauer (VP reaction), VP medium, Creatine solution, 1-Naphthol, Potassium hydroxide solution, Reagents for indole reaction, Tryptone-tryptophan medium, Kovacs reagent, Semi solid nutrient agar, Saline solution, Sera.</p>	<p>Salmonella</p> <p>CI 3.3, Table 1</p> <p>{IS 5887 (Part 3)}</p>
13.	Incubators 21 °C ± 1 °C and 37 °C, Colony counter, autoclave at 121 °C, Water bath capable of maintaining 44 °C to 47 °C, Plate count agar.	<p>Total plate count</p> <p>CI 3.3, Table 1</p> <p>(IS 5402)</p>
14.	Incubator (25 ± 1 °C), pH meter -temperature compensated, Yeast Extract-Dextrose-Chloramphenicol-Agar medium, Apparatus for Dry Sterilization (Oven) or Wet sterilization (Autoclave-121 ± 1°C),	<p>Yeast and Mould</p> <p>CI 3.3, Table 1</p>

	Incubator Capable of being maintained at 25 ±1°C, Water-Bath-Capable of being maintained at 45±1°C, Culture Bottles or Flasks, Graduated pipettes, Petri dishes.	(IS 5403)
15.	Hot air oven (capable of 180 °C), Autoclave (capable of 15 psi/ 121 °C) of suitable size as per need, Weighing Balance with least count 0.01 g (least count 0.001 g, if Tergitol-7 agar medium or Crystal violet neutral red bile lactose (VRBL) agar is being prepared in house), pH meter with least count 0.1 pH unit, Laminar air flow chamber OR inoculation room/cabinet fitted with U.V. tube light, Hot plate for media preparation, Membrane filtration assembly (including sterilized membrane filters of 47 mm to 50 mm diameter with 0.45 µm pore size, vacuum pump (for applying vacuum of about 70 kPa) and forceps with rounded tips), Inoculation loop/needle, Bunsen burner with LPG cylinder, Thermostatically controlled water bath, Air conditioner (recommended), Refrigerator, Colony counting equipment (recommended), General glass wares including, petri dishes (made of glass or plastic), volumetric pipettes (of capacity 1 ml and 10 ml), flasks, test tubes, culture bottles, funnels, glass rod, measuring cylinders, Thermometer with least count 1 °C, Filter Paper, Cotton	General microbiological lab equipments

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

Note 1. General Microbiological Lab Equipments as listed under Sr. No. 15 above are common for various microbiological tests. Other additional equipments required for specific test methods are indicated against each parameter.

ANNEX - B

**SCHEME OF INSPECTION AND TESTING
FOR SODIUM ALGINATE, FOOD GRADE
ACCORDING TO IS 5191 : 1993**

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 equipments.

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 Sodium Alginate, food grade 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 Storage – The material shall be packed and stored as given in clause 4.1 and 4.2 of IS 5191.

3.2 Marking - 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, Sodium Alginate, Food grade dried and blended at a time using the same consignment of raw material 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.

6. RAW MATERIAL – Routine analysis of various raw materials used in manufacturing of Sodium Alginate, Food grade shall be tested in the factory or alternatively raw materials of known composition may be used.

7. REJECTIONS – 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		
Cl.	Requirement	Test Methods Cl. Ref.	Test Method IS		No. of Sample	Frequency	Remarks
3.1	Description	3.1	IS 5191	R	One	Each control unit	See clause 5 of STI
3.2	Identification	3.2	IS 5191	R	One	Each control unit	
3.3, Table 1	Purity	Annex A	IS 5191	R	One	Each control unit	
3.3, Table 1	Moisture	Annex B	IS 5191	R	One	Each control unit	
3.3, Table 1	Matter insoluble in water	Annex A-3	IS 7928	R	One	Each control unit	
3.3, Table 1	Viscosity of a one percent solution (m/m)	Annex C	IS 5191	R	One	Each control unit	
3.3, Table 1	Ash (on dry basis)	Annex A-4	IS 7928	R	One	Each control unit	
3.3, Table 1	Acid insoluble ash (on dry basis)	Annex A-5	IS 7928	R	One	Each control unit	
3.3, Table 1	Lead (as Pb)	15.2	IS 1699	R	One	Each control unit	

3.3, Table 1	Arsenic (as As)	15.2	IS 1699	R	One	Each control unit
3.3, Table 1	Heavy metals (as Pb)	Annex A-6	IS 7928	R	One	Each control unit
3.4, Table 1	E. Coli	-	IS 5887 (Part 1)	R	One	Each control unit
3.3, Table 1	Salmonella	-	IS 5887 (Part 3)	R	One	Each control unit
3.3, Table 1	Total Plate count	-	IS 5402	R	One	Each control unit
3.3, Table 1	Yeast and mould	-	IS 5403	R	One	Each control unit

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