PRODUCT MANUAL
FOR AZOTOBACTER CHROOCOCCUM INOCULANTS
ACCORDING TO IS 9138 : 2009

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 9138 : 2009
	Title	:	Azotobacter Chroococcum Inoculants
	No. of Amendments	:	01
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	Each consignment of carrier material received in the factory shall be checked and record maintained. Specified mother culture be obtained from any recognized institution maintaining the mother culture.
b)	**Grouping guidelines**	:	Not applicable
c)	**Sample Size**	:	500 gram
3.	**List of Test Equipment**	:	Please refer ANNEX – A
4.	**Scheme of Inspection and Testing**	:	Please refer ANNEX – B
5.	**Possible tests in a day :**		
	(i) Viable Cells (ii) Fineness of Carrier (iii) pH (iv) Contaminants (v) Moisture		
6.	**Scope of the Licence :**		
	"Licence is granted to use Standard Mark as per IS 9138 : 2009 with the following scope:		
	Name of the product		Azotobacter Chroococcum Inoculants

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ANNEX-A
LIST OF TESTS EQUIPMENTS

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Viable Cells and Contaminants Cl 4.2 & 4.4 (Annex A of IS 9138)	Analytical balance (LC-0.01g , pH meter 0.01 (0 to 14), Autoclave, BOD incubator 0.1°C (28±2 °C), Hot air oven (300 °C), Water bath/Incubator-40-45℃, Orbital shaker (reciprocal shaker) (0 to 120 RPM), Laminar airflow (0-106 Air velocity), Cyclo mixer (0 to 190 RPM), Colony counter, Pipette - 1ml, 10ml, Conical flasks – 150 ml & 250 ml, Petri dishes, screw cap tubes - 10 ml, Bunsen burner, Congo Red, Agar, Yeast Extract, Mannitol ,Magnesium Sulphate ,Sodium Chloride ,Calcium Carbonate, Gram Staining, Microscope, Glucose, Peptone, Bromocersol Purple, Centrifuge, Measuring Cylinder(250ml),Sodium Hydroxide, Cotton, Isopropyl alcohol, Hydrochloric acid, Distilled Water, Sterile water, Potassium hydrogen phosphate.
2	Fineness of Carrier Cl 4.7	150 to 212 µ (72 to 100 mesh) IS sieve.
3	pH Cl 4.5 (Annex B of IS 9138)	pH meter, Analytical balance (0-200g, LC-0.01 mg), Rotary shaker (0 to 120 RPM), conical flasks –250 ml, Measuring cylinder-50ml, Funnels, Filter paper, Glass beaker, Glass rod, Standard pH buffers, Distilled water, Rhizobium Inoculants
4	Moisture Cl 4.9 (Annex B of IS 9138)	Analytical balance (0-200g, LC-0.01 mg), Hot air oven-capable of operating at 100-105°C, Desiccator, crucible, Rhizobium Inoculants.
5	Nitrogen Fixation in Pure Culture Cl 4.6 (Annex D of IS 9138)	Kjeldahl flasks -Heating device -Boiling chips or glass beads -Concentrated Sulphuric acid -Mercuric Oxide or Metallic Mercury -Potassium Sulphate or Anhydrous Sodium Sulphate -Zinc granules -Sulphite or Thiosulphate Solution -Sodium hydroxide -Hydrochloric acid or Sulphuric Acid, Standard Solution -Sodium hydroxide standard solution Methyl Red, Mixed indicator, Boric acid, Indicator Paraffin or Silicon Antifoam Analytical balance distillation assembly and Erlenmeyer flasks.
6	Quality of broth Cl 4.8 (Annex D of IS 9138)	Laminar Air flow, YEMA(Yeast extract mannitol agar) medium, Inoculation Loop, Incubator (28±2 °C), Microscope-100x lens, Hot air oven, –capable of operating at 30 to 450 °C, Autoclave , pH meter, Refrigerator/freezer, Water bath, Ammonium oxalate, Gram staining kit- Crystal violet solution, Iodine solution, Ethyl alcohol, Safranin (erythrosine), Immersion oil, Test tubes containing media broth. conical flask,Congo Red, Bunsen burner, Filter paper.
7	Packaging Material Cl 5.1	Micrometer with 0.01mm LC.

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

ANNEX B

SCHEME OF INSPECTION AND TESTING

FOR AZOTOBACTER CHROOCOCCUM INOCULANTS ACCORDING TO IS 9138 : 2009

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

1.1 It shall be obligatory for a licensee to employ a qualified soil microbiologist or general microbiologist or agricultural graduate in biology trained in soil microbiology on their staff (See forward para 4 of IS 8268).

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

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

3. PACKING, STORAGE AND MARKING - The Standard Mark as given in Schedule of the licence shall be printed on the packet of Azotobacter Chroococcum Inoculants, provided always that the material in each packet to which this mark is thus applied conforms to every requirement of the specification.

3.1 PACKING – Azotobacter Chroococcum Inoculants shall be packed in packaging material of low density polyethylene/polypropylene bags, thickness of which shall be 75-100 micron minimum.

3.2 **DIRECTIONS FOR THE USE** – Directions for use of Azotobacter Chroococcum Inoculants shall be printed briefly on the packet as given in Annex A of IS 9138. A separate pamphlet may preferably be given with it.

3.3 STORAGE – Azotobacter Chroococcum Inoculants shall be stored by the manufacturer in a cool and dry place away from direct heat preferably at a temperature of 15^0C to 30^0C. It shall also be the duty of the manufacturer to instruct the retailers and, in turn, the users about the precautions to be taken during storage.

3.4 MARKING - Marking shall be done as per clause 5.2 of IS 9138. 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 visitwww.bis.gov.in".

4. CONTROL UNIT - For the purpose of this scheme, the quantity of material blended in a blender at a time and taken from the same consignment of raw material shall constitute a control unit.

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

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

6. RAW MATERIAL – Routine analysis of each consignment of carrier material received in the factory shall be carried out. Carrier should be neutralized with calcium carbonate and sterilized. Proper records should be maintained for neutralization and sterilization.

6.1 Specified mother culture be obtained from any recognized institution maintaining the mother culture.

7. 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**
4.1	Colour	Visual		R	One	Each control unit	
4.2	Min. Viable Cells	Annex B	IS 9138	R	One	Each control unit	
4.3	Shelf life	4.3	-do-	R	One	Once in a month	
4.4	Contaminants	Annex B	-do-	R	One	Each control unit	
4.5	pH	Annex C	-do-	R	One	-do-	
4.6	Nitrogen Fixation	Annex D	-do-	R	One	Once in a month	
4.7	Carrier fineness	4.7	-do-	R	One	Each consignment of the carrier material received.	
4.8	Quality of broth	Annex D	-do-	R	One	One batch of broth	
4.9	Moisture	Annex E	-do-	R	One	Each control unit	
5	Packing, Marking and Storage	5.1, 5.2 and 5.3	-do-	R	One	Each control unit	

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.

FORM I

PROFORMAS OF RECORDS FOR CARRIER RECEIVED

Sl. No.	Date of Receipt	Source	Name of the carrier	Sieve Analysis	Colour	pH	Remarks