



उत्पाद मानुयल

RHIZOBIUM INOCULANTS

IS 8268 : 2020 के अनुसार

**PRODUCT MANUAL
FOR RHIZOBIUM INOCULANTS
ACCORDING TO IS 8268 : 2020**

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरण के प्रचलन में रीति और पारदर्शिता के सुसंगत सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

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.	उत्पाद Product	:	IS 8268 : 2020
	शीर्षक Title	:	Rhizobium Inoculants
	संशोधन संख्या No. of amendments	:	01
2.	नमूनाकरण दिशा निर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	The carrier material such as peat, lignite, peats oil, humus or similar material favoring growth to be neutralized with calcium carbonate and sterilized shall be in the form of a powder capable of passing through 150 to 212 micron (72 to 100 mesh) IS sieve
b)	समूहिकरण दिशा निर्देश Grouping Guidelines	:	Not Applicable
c)	नमूने का परिमाण Sample Size	:	500 gram
3.	परीक्षण उपकरणों की सूची	:	Please refer ANNEX – A

	List of Test Equipment		
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	Please refer ANNEX – <u>B</u>
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	(i) Viable Cells (ii) Fineness of Carrier (iii) pH (iv) Contaminants (v) Moisture		
6.	लाइसेन्स का कार्यक्षेत्र/Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 8268 : 2020 with the following scope:		
	Name of the product	Rhizobium Inoculants	

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

ANNEX-A TO PRODUCT MANUAL

FOR RHIZOBIUM INOCULANTS ACCORDING TO IS 8268 : 2020

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/Chemical
1	Viable Cells Cl 4.2 & 4.4 (Annex A of IS 8268)	Analytical balance (LC-0.01g), pH meter (LC 0.01, Range 0 to 14), Autoclave, BOD incubator 0.1°C (28±2 °C), Hot air oven (250 °C), Water bath/Incubator-40-45°C, Hand Tally or Mechanical Counting Device, Orbital shaker (reciprocal shaker), Laminar airflow , Cyclo mixer, Pipette - 1ml, 10ml, Conical flasks – 150 ml & 250 ml, Petri dishes, screw cap tubes - 10 ml, Measuring Cylinder(250ml), Bunsen burner, Congo Red, Agar, Yeast Extract, Mannitol, Magnesium Sulphate ,Sodium Chloride, Calcium Carbonate, Gram Staining, Microscope, Glucose, Peptone, Bromocresol Purple, Centrifuge, Sodium Hydroxide, Cotton, Isopropyl alcohol, Hydrochloric acid, Distilled Water, Sterile water, Potassium hydrogen phosphate.
2	pH Cl 4.5 (Annex B of IS 8268)	pH meter, Analytical balance (Range 0-200g, LC-0.01 mg), Rotary shaker, vacuum using a Buchner funnel conical flasks –250 ml, Measuring cylinder-50ml, Funnels, Filter paper (Whatman No. 1 filter paper or equivalent), Glass beaker, Glass rod, Standard pH buffers, Distilled water, Rhizobium Inoculants
3	Effective nodulation Cl 4.6 (Annex C of IS 8268)	Analytical balance (0-200g, LC-0.01 mg), Autoclave – capable of operating at 120°C, Hot air oven – capable of operating at 60°C, pH meter, Incubator- capable of operating at 28±2°C, Orbital shaker (0 to 120 RPM), Mortar & pestle, Beaker, Pipette, Seed, Earthenware/glazed pots, Soil, Coarse Sand, Scissors, screw capped bottles/ Test tubes with rubber hung, Desiccator, Pot culture house (growth rooms/cabinets), Plastic tube, , Soft tap water/RO water, 95% alcohol, Chlorine water /0.1% mercuric chloride, Sterile water, Conc. Sulphuric acid, Calcium chloride, Ammonium nitrate. PLANT NUTRIENT SOLUTION: Potassium chloride, Potassium hydrogen phosphate, Calcium Sulphate, Magnesium sulphate, Trace elements solution (Copper Sulphate, Zinc Sulphate, Magnesium, Sulphate,

		Ammonium molybdate, Boric acid) Iron solution (Ferrous sulphate, Citric acid), Mortar, Distilled water.
4	Fineness of Carrier CI 4.7	150 to 212 μ (72 to 100 mesh) IS sieve,
5	Quality of broth CI 4.8 (Annex D of IS 8268)	Laminar Air flow, Incubator (28 $\pm$ 2 °C), Autoclave ,Hot air oven, –up to 300 °C, Microscope-100x lens, Glass slides, Inoculation Loop, Refrigerator/freezer, Water bath, pH meter, Rotary shaker MEDIUM: YEMA (Yeast extract mannitol agar) medium, Ammonium oxalate, Gram staining kit- Crystal violet solution, Iodine solution, Ethyl alcohol, Safranin (erythrosine), Congo Red, Immersion oil, Test tubes containing media broth. conical flask, Distilled water, Bunsen burner, Filter paper, Gram staining Kit.
6	Moisture CI 4.9 (Annex B of IS 8268)	Analytical balance (Range 0-200g, LC-0.01 mg), Hot air oven (110°C), Desiccator.
7	Packaging Material CI 5	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 RHIZOBIUM INOCULANTS CCORDING TO IS 8268 : 2020

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 Rhizobium 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** – Rhizobium 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 Rhizobium Inoculants shall be printed briefly on the packet as given in Annex E of IS 8268. A separate pamphlet may preferably be given with it.

3.3 **STORAGE** – Rhizobium Inoculants shall be stored by the manufacturer in a cool and dry place away from direct heat preferably at a temperature of 15⁰C to 30⁰C. 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 8268. In addition, the following details shall be mentioned on each container legibly and indelibly:

a) BIS LicenceNo. 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 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 Standard and covered under the scope of this licence shall be marked with the Standard Mark.

5.2 A representative sample shall be taken from each control unit and tested for all the requirements given in Table 1 of STI except carrier fineness.

5.3 A sample shall be tested from each consignment of carrier material received for carrier fineness as given in Table 1 of STI.

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

6.1 Specific 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 Methods Cl. Ref.	Test Method IS		No. of samples	Frequency	Remarks
4.1	Colour	Visual	IS 8268	R	One	Each control unit*	
4.2	Min. Viable Cells	Annex A	-do-	R	One	-do-	
4.2.1	Presence of required strain	Annex D	-do-	R	One	-do-	
4.4	Contaminants	Annex A	-do-	R	One	-do-	
4.5	pH	Annex B	-do-	R	One	-do-	
4.6	Effective Nodulation	Annex C	-do-	R	One	Once in a season for each strain of Rhizobium	Record of isolation and identification of various strains of Rhizobium culture used for different crops, nodulation ability and effectiveness shall be maintained in a separate register.
4.7	Fineness of Carrier	4.7	-do-	R	One	Each consignment Of the carrier material received	Ref. Clause 5.3 of SIT.
4.8	Quality of broth	Annex D	-do-	R	One	Each batch	
4.9	Moisture	4.9	-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. Subcontracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled 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

PROFORMA OF RECORD FOR CARRIER RECEIVED

Sl. No.	Date of receipt	Source	Name of the carrier	Sieve analysis	Colour	pH	Remarks

Separate record shall be maintained for:

- i) Quality of each batch of broth used.
- ii) Nodulation test to be carried out once in a season for each strain of Rhizobium