



फसल संरक्षण उपकरण - पैर चालित फुहारा - विशिष्ट और परीक्षण संहिता
भारतीय मानक 3652: 2024 के अनुसार

**PRODUCT MANUAL
FOR
CROP PROTECTION EQUIPMENT -
FOOT SPRAYER - SPECIFICATION
AND TEST CODE
ACCORDING to IS 3652: 2024**

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो) अनुरूपता मूल्यांकन (विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity 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.

1.	मानक संख्या IS No.	:	IS 3652: 2024
	शीर्षक Title	:	फसल संरक्षण उपकरण - पैर चालित फुहारा - विशिष्ट और परीक्षण संहिता Crop Protection Equipment - Foot Sprayer - Specification and Test Code.
	संशोधनों की संख्या No. of amendments	:	01
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	- The material of construction of various components of the sprayer shall be selected from col (3) of Table 1 of IS 3652. - The brass casting components shall conform to chemical composition of IS 292 (grade to be declared by the manufacturer). - The material used for different components shall be declared by the manufacturer in the manual (see 7.1). - The engineering plastics used for manufacturing various components as given in Table 1 shall be

		co-polymer plastics or reinforced high density polyethylene or reinforced polypropylene. <i>Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.</i>
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	: Not applicable.
c)	नमूने का परिमाण Sample Quantity	: 1. 1 set of foot sprayer with complete kit of Manual, Spare parts and safety. 2. Additional sets of gaskets/pistons/springs as required under Cl. 12.3, 12.4 and 12.5 of IS 3652. <i>Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)</i>
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	: Average working pressure in kPa. <i>Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.</i>
3.	परीक्षण उपकरणों की सूची List of Test Equipment	: Please refer to Annex-A .
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	: Please refer to Annex-B .
5.	एक दिन में संभावित परीक्षण Possible tests in a day	
	All tests except Endurance test, Test for Spray gun and Nozzle. <i>Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies(OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.</i>	

6.	लाइसेंस का दायरा/Scope of the Licence:	
	“Licence is granted to use Standard Mark as per IS 3652: 2024 with amendment no. 1 with the following scope:	
	Name of the product	Crop Protection Equipment - Foot Sprayer - Specification and Test Code
	Average Working Pressure	As declared (in kPa).

**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9, BAHADUR SHAH ZAFAR
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ANNEX - A
LIST OF TEST EQUIPMENT
(INDICATIVE LIST, FOR GUIDANCE ONLY)

Clause	Test	Test Facilities
5	Performance Requirement	1. Test bench as per Fig. 4 2. Water filled container 3. Motor operated adjustable crank mechanism 4. Straight rigid tube, Pressure regulator and gauge on another test bench 5. Timer
6.3.1 and 6.4	Pump Cylinder and Pressure Chamber	1. Hose 2. Pneumatic test arrangement 3. Hydraulic test arrangement
6.3.2 and 6.9	Piston and Gaskets	1. Immersion vessel 2. Kerosene 3. Benzene 4. Toluene 5. Xylene 6. Timer 7. Arrangement for temperature range of 27 °C to 33 °C with air-drying.
6.3.6	Spring	1. Arrangement for continuously applying 16 strokes per minute for 90 min
6.5	Threaded Connections	1. Gauges
6.6	Suction and Delivery Spout	1. Vernier calliper
6.7.1	Suction Hose	1. Measuring tape
6.7.2	Strainer Assembly	1. Equipment for measuring size of aperture 2. Vernier calliper
6.8.1 and 6.8.2	Delivery Hose and Hose Connections	1. Measuring tape 2. Timer 3. Hydrostatic pressure assembly
6.8.3	Cut-off Device	1. Vernier Calliper 2. Equipment for measuring size of aperture 3. Arrangement of Trigger Actuation Test 4. Hydraulic test arrangement 5. Test liquid 6. Timer 7. Appropriate test apparatus
6.8.3	Spray Lance	1. Measuring tape 2. Angle measurement arrangement
6.8.3	Spray Gun	1. Thickness gauge 2. Vernier Calliper 3. Pressure gauge and apparatus 4. Torque measuring instrument

		5. Blotting paper or any other suitable paper 6. Measuring tape 7. Testing place free from draught 8. Hydraulic pump 9. Timer 10. Weighing balance
6.8.4	Nozzle	1. Swirl chamber or alternative as per G-2.1.1 2. Pressure gauge and assembly 3. Angle measurement arrangement 4. Timer
6.10	Handle	1. Vernier calliper
6.12	Total Mass	1. Weighing balance

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

ANNEX - B
SCHEME OF INSPECTION AND
TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: *all Crop Protection Equipment - Foot Sprayer of the same type produced under essentially the same conditions of manufacture in a day.*

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in [Table 1](#). Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

2. ENSURING COMPLIANCE THROUGH TESTING- manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
 - a) BIS recognised/empanelled laboratories, or

b) Any accredited laboratory as per ISO/IEC 17025

2.1 TEST RECORDS- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark, as given in the Schedule of the licence, shall be incorporated legibly and indelibly on each Foot Sprayer, provided always that the material so marked, conform to every requirement of the specification.

3.1 Packing and marking shall be done as per the provision of the Indian Standard. In addition, each foot sprayer shall also be marked with the following additional requirement:

a) BIS Licence No. CM/L _____.

b) BIS website details: "For BIS certification details please visit www.bis.gov.in"

3.2 A kit of Manual, Spare parts and Safety, shall be provided as per the provision of the Indian Standard.

4. REJECTION - The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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

(Recommended Levels of Control by BIS - For Guidance Only)

(1)				(2)	
Test Details				Levels of Control	
<i>Clause</i>	<i>Requirement</i>	<i>Test Methods</i>		<i>No. of Sample</i>	<i>Frequency</i>
		<i>Clause</i>	<i>Reference</i>		
4	Materials	Table 1	IS 3652	One	Each consignment of each material *
Performance Requirements					
5.1	Discharge rate	11.1	IS 3652	One	Each sprayer
5.2	Volumetric Efficiency	11.2	IS 3652	One	Each sprayer
5.3	Endurance Test (Routine check)	11.3	IS 3652	One	Each sprayer
5.3	Endurance Test	11.3	IS 3652	One	Once in a month
Construction Requirements					
6.1	Frame	12.1	IS 3652	One	Each Control Unit
6.2	Pedal and Pedal Lever	12.1	IS 3652	One	Each Control Unit
6.3.1 and 6.4	Pump Cylinder and Pressure Chamber	12.2	IS 3652	One	Each Control Unit
6.3.2 and 6.9	Piston and Gaskets	12.3	IS 3652	One	Once in a month
6.3.3	Piston Spreader	6.3.3	IS 3652	One	Each Control Unit
6.3.4	Piston Rod	12.1	IS 3652	One	Each Control Unit
6.3.5	Guide	6.3.5	IS 3652	One	Each Control Unit
6.3.6	Spring	12.5	IS 3652	One	Each Control Unit
6.5	Threaded Connections	-	IS 2643	One (All metallic threaded connections)	Each Control Unit
6.6	Suction and Delivery Spout	6.6	IS 3652	One	Each Control Unit
6.7.1	Suction Hose	6.7.1	IS 3652	One	Each Control Unit
6.7.2	Strainer Assembly	6.7.2	IS 3652	One	Each Control Unit
6.7.3	Hose Connections	6.7.3	IS 3652	One	Each Control Unit
6.8.1 and 6.8.2	Delivery Hose and Hose Connections	12.4	IS 3652	One	Each Control Unit
6.8.3	Cut-off Device	Annex D	IS 3652	One	Once in a month
6.8.3	Spray Lance	Annex E	IS 3652	One	Each Control Unit
6.8.3	Spray Gun	Annex F	IS 3652	One	Each Control Unit
6.8.4	Nozzle	Annex G	IS 3652	One	Once in a month
6.10	Handle	6.10	IS 3652	One	Each Control Unit
6.11	Lifting Arrangement	6.11	IS 3652	One	Each Control Unit
6.12	Total Mass	6.12	IS 3652	One	Each Control Unit

Other Requirements					
7	Manual, Spare parts and Safety	7	IS 3652	One	Each Control Unit
8	Workmanship and Finish	8	IS 3652	One	Each Control Unit

* No testing is required, if material is accompanied with suppliers' Test Certificate.