

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS-445/2562/2020
माह/Month: October, 2020

THIS TEST REPORT VALID UP TO : 31st October, 2025



**RICOITALY, RI 16 BT
BATTERY OPERATED KNAPSACK SPRAYER**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

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xxxiv)	The material used for different components shall be declared by the manufacturer, all the components mentioned in the table-I may not be present in a particular sprayer.	Not Declared	Does not conform
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**3. TEST FOR DISCHARGE RATE OF PUMP
(Vide Clause 8.3 of IS – 11313: 2007)**

1. Date of test : 23.10.2020
2. Atmospheric conditions :
 - a) Temperature : 25.9 °C
 - b) Relative humidity : 36.4 %
 - c) Pressure : 98.8 kPa

3. Data recorded

Speed of Pump (rpm)	Pressure (kg/cm ²)	Test No.	Delivery from the discharge line (ml/min)	Overflow (ml/min)	Average discharge from the discharge line (ml/min)	Discharge rate of pump (ml/min)
3386	1	1	2620	NIL	2672.5	2672.5
		2	2720			
		3	2650			
		4	2700			
3197	2	1	2280	NIL	2270.0	2270.0
		2	2250			
		3	2270			
		4	2280			
3150	3	1	2020	NIL	2015.0	2015.0
		2	2000			
		3	2010			
		4	2030			
3138	4	1	1800	NIL	1787.5	1787.5
		2	1780			
		3	1780			
		4	1790			

Minimum discharge rate = 1787.5 ml/min at 4 kg/cm²

Maximum discharge rate = 2672.5 ml/min at 1 kg/cm²

Discharge at rated pressure = 2270.5 ml/min at 2 kg/cm²

**4. TEST FOR VOLUMETRIC EFFICIENCY
(Vide Clause 8.4 of IS – 11313: 2007)**

- Rated pressure, kg/cm² : 2
- Avg. discharge of water at rated pressure, ml/min : 2290.0
- Avg. discharge of water at no-load, ml/min : 3615.0
- Avg. pump speed at no-load, rev/min : 3735
- Avg. pump speed at rated pressure, rev/min : 3197
- Volumetric efficiency of pump, % : 73.9

Remarks: The volumetric efficiency does not conform to the requirement of IS: 11313:2007.



5. POWER REQUIREMENT (Vide Clause 8.5 of IS – 11313 : 2007)

Power requirement of DC motor fitted on sprayer was observed as following:-

1. Motor operating voltage : 12 V
2. Avg. current drawn by motor at no load : 1.15 A
3. Avg. current drawn by motor at load : 1.70 A
4. Avg. motor operating voltage : 12 V
5. Avg. observed motor power requirement : 20.91 watt
6. Avg. motor speed at no load : 3735 rpm
7. Avg. motor speed at load : 3197 rpm
8. Avg. time required for fully discharge of battery : 4.1 to 5.5 h
9. Avg. No load rpm of motor after 6 hours of operation : 2390 rpm

6. PRESSURE ADJUSTMENT TEST

1. Date of test : 23.10.2020
2. Atmospheric conditions:-
 - a. Temperature : 20.6 °C
 - b. Relative humidity : 48.9 %
 - c. Pressure : 99.3 kPa
3. Data recorded

S. No.	Working pressure (kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	1	NIL	NIL	--
2.	2	NIL	NIL	--
3.	3	NIL	NIL	--
4.	4	NIL	NIL	--

4. Resistance of pressure: Yes

7. TEST FOR SPRAY LANCE (Vide Annex D of IS – 3652: 1995)

- Date of test : 16.10.2020
Type : Straight (Type-A)

7.1 STRENGTH OF SPRAY LANCE

Sr. No	Details	Condition
1	Test Condition	Outlet closed
2	Hydraulic pressure applied	1 MPa
3	Duration of pressure retained	5 minutes
4	Result	No leak, crack, or burst of lance was observed during test

7.2 MARKING ON SPRAY LANCE

- Manufacturer's name or recognized trade mark : **Not Marked**
Nominal length : **Not Marked**

8. TEST FOR CUT-OFF DEVICE
(Vide Annex C Clause 6.8.3 of IS – 3652: 1995)

Date : 16.10.2020
Type : Trigger type (Type – A)

8.1 MAXIMUM TRIGGER ACTIVATION TORQUE

Required torque	:	Observed torque
Less than 35 kgf-cm	:	28.5 kgf-cm

8.2 STRENGTH TEST FOR CUT-OFF DEVICE

Sr. No	Details	Condition
1	Condition of outlet	Closed
2	Hydraulic pressure	750 kPa
3	Duration of pressure retained	5 Minute
4	Observation	No leak, crack or burst of cutoff device was observed during test.

8.3 LEAKAGE AND RELIABILITY TEST FOR CUT-OFF DEVICE

Sr. No.	Details	Condition
1	Test Condition	Mounted on test setup
2	Hydraulic pressure retained	300 kPa
3	Operating cycles	5000 cycles at pressure 300 kPa and repeated for 500 cycles at a pressure of 600 kPa @ 15 cycles per minutes
4	Observation	No drip or leak of cut off device through valve was observed during the test

8.4 MARKING ON CUT-OFF DEVICE

- a) Manufacturer's name or recognized trade mark : **Not Marked**
b) Batch or code number : **Not Marked**

9. TEST FOR NOZZLE
(Vide Annex F of IS – 3652: 1995)

Date of test : 20.10.2020
Type of Nozzle : Solid Cone



10. ENDURANCE TEST OF SPRAYER
(Vide clause 8.8 of IS-11313:2007)

1. Date of test :- 05.10.2020 to 10.10.2020
2. Total running time (h)-50
3. Quantity of liquid collected during endurance:-
Avg. Discharge (ml/min)
 - a) First Collection - 2317.5
 - b) Second Collection - 2322.5
 - c) Third Collection - 2437.5
 - d) Fourth collection - 2307.5
 - e) Fifth Collection - 2352.5
 - f) Sixth Collection - 2227.5
 - g) Seventh Collection - 2382.5
4. Percentage variation of discharge from first to last collection, 2.80 %.

11. TEST FOR PUMP CHAMBER
(Vide Clause 7.1 of IS 10134-1994)

Date of test : 21.10.2020

Sr. No	Details	Condition
1	Test Condition	: Outlet end closed
2	Pressure applied -Hydraulic pressure	: Motor stopped beyond 4.0 kg/cm ² pressure against the pressure requirement of 5 kg/cm ² .
	-Pneumatic pressure	: 3 kg/cm ²
3	Duration	: 1 minutes each
4	Result	: No leakage, crack deformation or breakage observed in pump chamber during the test.

Remarks: Tendency of stalling of motor was observed beyond 4 kg/cm² hydraulic pressure and therefore test could not be taken up to the required pressure of 5 kg/cm² and therefore sprayer does not conform to the requirement laid down in Clause 7.1 of IS: 10134-1994.



17. COMMENTS & RECOMMENDATIONS

- 17.1 The battery charger make, model and country of origin is not specified. It should be specified
- 17.2 The motor make, model and speed is not specified. It should be specified.
- 17.3 The pump serial number & country of origin is not specified. It should be specified.
- 17.4 The material of pump inlet port end fitting does not conform the requirement of relevant code/standard. It **MUST** be looked into.
- 17.5 The manufacturer's name or recognized trade mark and batch or code number of cut off device is not marked. It **MUST** be looked into.
- 17.6 Make, model and country of origin is not specified. It **MUST** be specified.
- 17.7 The material used for different components are not declared. It **MUST** be declared.
- 17.8 The strainer in nozzle is not provided. It may be considering for providing.
- 17.9 The volumetric efficiency of pump does not meet the requirement of Indian Standard. It **MUST** be improved.
- 17.10 Agitator is not provided. It may be provided.
- 17.11 The strap cushion thickness does not meet the requirement of Indian Standard. It may be looked into.
- 17.12 The current drawn by motor at no load and on load was observed as 1.15 A and 1.70 A respectively which does not conform to requirement of IS- 14459: 1997.
- 17.13 Time required to full charge the battery with AC charger is observed as 8.0 to 8.3 hours.
- 17.14 The spraying operation time after fully charging the battery was observed as 4.1 to 5.5 hours.
- 17.15 During the pump chamber hydraulic test the motor stopped beyond 4 kg/cm² pressure against the pressure requirement of 5 kg/cm² and the test could not be conducted. This **MUST** be looked into and improved.
- 17.16 The discharge rate of nozzle for fine cone spray pattern does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 17.17 During the strap drop test the buckle/bracket of strap assembly found failed to hold the strap in it's position. It should be improved.
- 17.18 The average size of strainer of cut off device does not meet the requirement of Indian Standard. It **MUST** looked into.
- 17.19 No necessary tools are provided with sprayer. It **MUST** be provided.
- 17.20 The strap width does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 17.21 The discharge outlet nipple length does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 17.22 Spray angle of nozzle at 300 kPa pressure does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 17.23 The manufacturer's name or recognized trade mark and nominal length of lance is not marked. It **MUST** be looked into.
- 17.24 Manufacturer's name or recognized trade mark and batch or code number of nozzle is not marked. It **MUST** be looked into.
- 17.25 The spray nozzle is not designated. It **MUST** be looked into.



- 17.26 The average aperture size of filling hole strainer does not meet the requirement of Indian standard. It **MUST** be looked into.
- 17.27 A suitable labeling plate (not sticker) needs to be provided with "interalia", following information.
- Manufacturer's name
 - Make
 - Model
 - Month & year of manufacture
 - Rated speed
 - Rated pressure
 - Discharge rate
 - Power rating
 - Country of origin

18. TECHNICAL LITERATURE

No technical literatures are provided with sprayer for guidance to the users. It is therefore recommended to provide **operator manual** as per IS: 8132-1999.

In addition service manual and part catalogue may also be provided for guidance of users.

TESTING AUTHORITY

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY DIRECTOR	

19. APPLICANT'S COMMENTS

No Comment's received from applicant

