

THIS TEST REPORT VALID UP TO : 28th FEBRUARY, 2024



**ASPEE ADT001/12AHBR
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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[ISO 9001:2015 CERTIFIED]

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Material of construction of various components as per IS: 3906-1995				
xxxiii)	Strap	Woven web cotton/synthetic yarn	Synthetic yarn	Conforms
	Skirt/Stand	Steel, plastic	Plastic	Conforms
	Strap buckle	Steel, Engg. Plastic	Plastic	Conforms
	Cushion	Foam, rubber, foam plastic	Foam plastic	Conforms
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.			Declared Conforms

3. TEST FOR DISCHARGE RATE OF PUMP (Vide Clause 8.3 of IS – 11313: 2007)

1. Date of test : 18.01.2019
2. Atmospheric conditions :
 - a) Temperature : 18.4 °C
 - b) Relative humidity : 55.5%
 - c) Pressure : 99.1 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)
3442	1	1	2900	NIL	2845	2845
		2	2820			
		3	2820			
		4	2840			
3293	2	1	2450	NIL	2450	2450
		2	2450			
		3	2470			
		4	2430			
3242	3	1	2150	NIL	2125	2125
		2	2150			
		3	2100			
		4	2100			
3227	4	1	1700	NIL	1690	1690
		2	1700			
		3	1670			
		4	1690			

Minimum discharge rate = 1690 ml/min at 4 kg/cm²
 Maximum discharge rate = 2845 ml/min at 1 kg/cm²
 Discharge at rated pressure = 2125 ml/min at 3 kg/cm²

4. TEST FOR VOLUMETRIC EFFICIENCY

(Vide Clause 8.4 of IS – 11313: 2007)

Rated pressure, kg/cm ²	:	3
Avg. discharge of water at rated pressure, l/min	:	2.125
Avg. discharge of water at no-load, l/min	:	3.550
Avg. pump speed at no-load, rev/min	:	3741
Avg. pump speed at rated pressure, rev/min	:	3242
Volumetric efficiency of pump, %	:	69

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	:	0.88 A
3. Avg. current drawn by motor at load	:	1.97 A
4. Avg. motor operating voltage	:	12.57 V
5. Avg. observed motor power requirement	:	24.71 watt
6. Avg. motor speed at no load	:	3742 rpm
7. Avg. motor speed at load	:	3240 rpm
8. Avg. time required for fully discharge of battery	:	8 to 8.5 h
9. Avg. No load rpm of motor after 6 hours of operation	:	2460 rpm

6. PRESSURE ADJUSTMENT TEST

1. Date of test	:	18.01.2019
2. Atmospheric conditions:-		
a. Temperature	:	18.4 °C
b. Relative humidity	:	55.5 %
c. Pressure	:	99.1 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	:	16.01.2019
Type	:	Gooseneck (Type-B2)

- iii) Spray nozzle and spray gun as per IS:3652-1995 : **Does not conform in toto**
(Reaffirmed 2011)
- iv) IS: 2643-2005-Pipe threads where pressure-tight : **Does not conform in toto**
joint are not made on the threads-dimensions,
tolerance and designation

16. COMMENTS & RECOMMENDATIONS

- 16.1 Battery Serial No. is not specified. It should be specified.
- 16.2 The speed of motor is not specified. It should be specified.
- 16.3 The model of battery charger is not specified. It should be specified.
- 16.4 The rated speed of pump is not specified. It should be specified.
- 16.5 The strainer in nozzle is not provided. It may be considering for providing.
- 16.6 The volumetric efficiency of pump does not meet the requirement of Indian Standard. It **MUST** be improved.
- 16.7 Agitator is not provided. It may be provided.
- 16.8 The strap cushion thickness does not meet the requirement of Indian Standard. It may be looked into.
- 16.9 The current drawn by motor at no load and on load was observed as 0.88A and 1.97A respectively which does not conform to requirement of IS- 14459: 1997.
- 16.10 Time required to full charge the battery with AC charger is observed as 8.0 to 8.5 hours.
- 16.11 The spraying operation time after fully charging the battery was observed as 7.5 to 8.0 hours.
- 16.12 During the pump chamber hydraulic test the motor stopped beyond 6 kg/cm² pressure against the pressure requirement of 7.5 kg/cm² and the test could not be conducted. This **MUST** be looked into and improved.
- 16.13 During the test of leakage and reliability test for cut off device the leakage through the valve was observed. It **MUST** be looked into for necessary action.
- 16.14 The discharge rate of nozzle for fine cone spray pattern does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.15 The spray angle for fine cone spray pattern of nozzle at a pressure of 300 kPa does not conform to the requirement of IS : 3562-1995. It **MUST** be looked into.
- 16.16 The variation of discharge rate of pump does not meet the requirement of IS: 11313:2007. It **MUST** be looked into.
- 16.17 The dimension of metallic threaded connection does not conform to the requirement of relevant /code Standard.
- 16.18 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.
- 16.19 The material of pump inlet port end fitting does not meet the requirement of Indian Standard. It should be improved.
- 16.20 The average size of strainer of cut off device does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.21 No necessary tools are provided with sprayer. It **MUST** be provided.

16.22 A suitable labeling plate (not sticker) needs to be provided with ,inter alia ,following information;-

- i. Manufacturer's name
- ii. Make
- iii. Model
- iv. Month & year of manufacture
- v. Rated speed
- vi. Rated pressure
- vii. Discharge rate
- viii. Power rating
- ix. Country of origin

16.23 Safety provision/Safety wear

- i) Safety instruction regarding handling poisonous agro-chemical before, during and after spraying operation should be provided on sprayer.

17. TECHNICAL LITERATURE

The following literature provided with sprayer for guidance to the user.

- i) Operator's manual with parts catalogue.

The operator instruction manual of sprayer needs to be updated as per IS : 8132-1999.

TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	<i>Ren</i>
P. K. PANDEY DIRECTOR	<i>PKP - mvg</i>

18. APPLICANT'S COMMENTS

Para No	Our reference	Applicant's comments
18.1	16.2,16.3,16.4	Noted, will specify.
18.2	16.6,16.13,16.18,16.20	Noted, we will improve.
18.3	16.9	Noted.
18.4	16.22	We will provide stickers providing complete information.

