

**व्यावसायिक परीक्षण रिपोर्ट**  
**COMMERCIAL TEST REPORT**

संख्या/ No.: PS-388/2303/2019  
माह/Month : April, 2019

**THIS TEST REPORT VALID UP TO : 30<sup>th</sup> APRIL, 2024**



**ASPEE, ADE001/8 AHBR BATTERY CUM  
HAND 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

**Northern Region Farm Machinery Training and Testing Institute**

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**[ISO 9001:2015 CERTIFIED]**

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	Strap	Woven web cotton/ synthetic yarn	Synthetic yarn	Conforms
	Skirt/ stand	Steel, plastic	Plastic	Conforms
	Strap buckle	Steel, Engg. Plastic	Engg. 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. RUNNING - IN

Though the applicant has not recommended running-in, with the consent of the applicant the running-in of the sprayer was conducted for one hour in order to overcome variation in initial performance. Lubrication and the adjustment of the components were done as per applicants' recommendation.

### 4. 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 °C
  - b) Relative humidity : 55 %
  - c) Pressure : 99.1 kPa

#### 3. Data recorded

Speed of Pump (rpm)	Working pressure (kg/cm <sup>2</sup> )	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)
2890	1	1	2000	NIL	1955.0	1955.0
		2	1950			
		3	1920			
		4	1950			
2788	2	1	1700	NIL	1695.0	1695.0
		2	1720			
		3	1690			
		4	1670			
2763	3	1	1460	NIL	1445.0	1445.0
		2	1450			
		3	1450			
		4	1420			
2708	4	1	1150	NIL	1132.5	1132.5
		2	1120			
		3	1130			
		4	1130			

Minimum discharge rate = 1132.5 ml/min at 4 kg/cm<sup>2</sup>  
 Maximum discharge rate = 1955.0 ml/min at 1 kg/cm<sup>2</sup>  
 Discharge at rated pressure = 1445.0 ml/min at 3.0 kg/cm<sup>2</sup>



### 5. TEST FOR VOLUMETRIC EFFICIENCY (Vide Clause 8.4 of IS: 11313 - 2007)

Date of test	:	21.01.2019
Rated pressure, kg/cm <sup>2</sup>	:	3
Avg. discharge of water at rated pressure, l/min	:	1.445
Avg. discharge of water at no load, l/min	:	2.585
Avg. pump speed at no load, rev/min	:	3153
Avg. pump speed at rated pressure, rev/min	:	2763
Volumetric efficiency of pump, %	:	64 %

**Remark: - The volumetric efficiency does not conform to the requirement of IS: 11313-2007.**

### 6. POWER REQUIREMENT (Vide Clause 8.5 of IS - 11313 : 2007)

The 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	:	0.80 A
3. Avg. current drawn by motor at load	:	1.44 A
4. Avg. motor operating voltage	:	12 V
5. Avg. observed motor power requirement	:	18.23 Watt
6. Avg. motor speed at no load	:	3152 rpm
7. Avg. motor speed at load	:	2761 rpm
8. Avg. Time required for fully discharge of battery	:	8 to 8.5 hr
9. Avg. No load rpm of motor after 6 hours of Operation	:	970 rpm

### 7. PRESSURE ADJUSTMENT TEST (Vide Clause 8.7.1 of IS - 11313 : 2007)

1. Date of test : 18.01.2019
2. Atmospheric conditions :
  - a. Temperature : 18 °C
  - b. Relative humidity : 55 %
  - c. Pressure : 99.1 kPa
3. Data recorded

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

4. Resistance of pressure: Yes





xxi)	Gasket	Synthetic rubber, PVC, fibre	PVC	Conforms
xxii)	Valve seat	Brass, stainless steel, engg. plastic	Engg. Plastic	Conforms
xxiii)	valve	Brass, stainless steel, engg. plastic	Engg. Plastic	Conforms
xxiv)	Skirt/ stand	Steel, plastic	Plastic	Conforms
xxv)	Strap buckle	Steel, Engg. Plastic	Engg. Plastic	Conforms
xxvi)	Cushion	Foam rubber, foam plastic	Foam Plastic	Conforms

**Materials of components of spray lance, nozzle, cut of device (as per IS 3652-1995):**  
**Refer chapter No. 2 of this test report.**

Clause No.	Specified requirement	Observations	Remarks
Cl. 4.4 IS 3906:1995	The material used for different components shall be declared by the manufacturer in the manual.	Declared	Conforms

## 16. RUNNING - IN

Though the applicant has not recommended running-in, with the consent of the applicant the running-in of the sprayer was conducted for one hour in order to overcome variation in initial performance. Lubrication and the adjustment of the components was done as per applicants recommendation.

## 17. TEST FOR DISCHARGE RATE

(Vide Clause 6.1.3 of IS 10134-1994)

1. Date of test : 10.01.2019
2. Atmospheric conditions :
  - a) Temperature : 19°C
  - b) Relative humidity : 56%
  - c) Pressure : 99 kPa

### 3. Data recorded

No. of hand strokes per minute	Working pressure (kPa)	Test No.	Delivery from the discharge line (ml/min)	Overflow (ml/min)	Average delivery from the discharge line (ml/min)	Discharge rate of pump (ml/min)
16	300	1	580	Nil	587.5	587.5
16	300	2	600	Nil		
16	300	3	590	Nil		
16	300	4	580	Nil		

**Average discharge rate : 587.5 ml/min at 300 kPa pressure**



### 18. TEST FOR VOLUMETRIC EFFICIENCY

(Vide Clause 6.2 of IS 10134-1994)

	Date of test	:	15.01.2019
Sl. No.	Details		Observation
1.	Discharge of water in 10 successive stroke	:	347.5 ml
2.	No of cycle	:	10
3.	Actual volume of water in one cycle	:	34.75 ml
4.	Inner diameter of pump cylinder	:	45 mm
5.	Stroke length at 300 kPa pressure	:	27.36 mm
6.	Piston displacement	:	43.52 cc
7.	Theoretical volume of water in one cycle	:	43.52 ml
8.	Volumetric efficiency, %	:	80%

**Remark: The volumetric efficiency of pump does not conform to the requirement of IS 10134-1994.**

### 19. TEST FOR PRESSURE CHAMBER

(Vide Clause 7.1 of IS 10134-1994)

Date of test : 10.01.2019

Sr. No	Details	Condition
1	Test Condition	Outlet end closed
2	Pressure applied -Hydraulic pressure  -Pneumatic pressure	<b>The operating handle found distorted at 5.5 kg/cm<sup>2</sup> pressure during the test</b> 4.5 kg/cm <sup>2</sup>
3	Duration	1 minutes each
4	Result	No leakage, crack, deformation or breakage observed in pressure chamber during the test.

**Remark: The operating handle found distorted at 5.5 kg/cm<sup>2</sup> pressure and therefore sprayer does not conform to the requirement laid down in clause 7.1 of IS : 10134:1994.**

### 20. TEST FOR OPERATING LEVER, HANDLE & PISTON ROD

(Vide clause 7.6 of IS-10134:1994)

Date of test : 10.01.2019

Sr. No	Details	Condition
1	Test Condition	Discharge outlet closed
2	Pressure applied	7.5 kg/cm <sup>2</sup>
3	Result	<b>The operating handle found distorted at 5.5 kg/cm<sup>2</sup> pressure during the test</b>



**25. CONFORMITY TO INDIAN STANDARDS**

- i) IS: 11313:2007 Hydraulic power sprayers- : **Does not conform in toto**  
specification
- ii) IS: 10134-1994-Method of test for manually : **Does not conform in toto**  
operated sprayer
- iii) Spray nozzle and spray gun as per IS:3652- : **Does not conform in toto**  
1995 (Reaffirmed 2011)
- vi) IS: 2643-2005-Pipe threads where pressure- : **Does not conform in toto**  
tight joint are not made on the threads-  
dimensions, tolerance and designation

**26. COMMENTS & RECOMMENDATIONS**

- 26.1 The sprayer year of manufacture is not marked. It should be marked.
- 26.2 The motor power and rated speed is not specified. It should be specified.
- 26.3 The make, serial number and country of origin of battery is not specified. It should be specified.
- 26.4 The make and model and country of origin of battery charger is not specified. It should be specified.
- 26.5 The model and country of origin of pump is not specified. It should be specified.
- 26.6 The dimension of straps does not meet the requirements of Indian Standard. It **MUST** be looked into.
- 26.7 During the strap drop test the buckle/bracket of strap assembly found failed to hold the strap in its position. It should be provided.
- 26.8 The strap cushion thickness does not meet the requirement of Indian standard. It **MUST** be looked into.
- 26.9 The average size of strainer of cut-off device does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 26.10 The spray angle of nozzle at 300 kPa pressure does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 26.11 Material used for pump inlet port end fitting does not meet the requirement of IS:11313-2007. It **MUST** be looked into.
- 26.12 Material used for end fitting of spray lance does not meet the requirement of IS:3652-1995. It **MUST** be looked into.
- 26.13 The length of spray lance does meet the requirement of IS:3652-1995. It **MUST** be looked into.





- 26.14 The discharge rate of nozzle at a pressure of 300 kPa for fine cone spray pattern does not conform to the requirement of IS: 3652-1995.
- 26.15 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.
- 26.16 The strainer in nozzle is not provided. It should be provided.
- 26.17 Agitator is not provided in sprayer. It may be provided.
- 26.18 Time required to full charge battery with AC charger is observed as 8.0 to 8.5 hours.
- 26.19 The spraying operation time after fully charging the battery was observed as 7.0 to 8.0 hours.
- 26.20 The current drawn by motor at no load and on load was observed 0.80 to 1.44 Amp. which does not conform to requirement of IS: 14459:1997.
- 26.21 The volumetric efficiency of sprayer on battery operated mode was observed as 64%, which is not within the requirement of the relevant Indian Standard.
- 26.22 The volumetric efficiency of sprayer on hand operated mode was observed as 80% which is not within the requirement of the relevant Indian Standard.
- 26.23 No necessary tools are provided with sprayer. It **MUST** be provided.
- 26.24 During the pump chamber hydraulic test the motor stopped beyond 5.5 kg/cm<sup>2</sup> pressure against the pressure requirement of 7.5 kg/cm<sup>2</sup>. Thus the sprayer does not meet the requirement of Indian Standard.
- 26.25 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.
- 26.26 The operating lever of sprayer found distorted during test. It should be examined & improved.
- 26.27 The metallic threaded connection does not meet the requirement of IS:3652-1995. It **MUST** be looked into.
- 26.28 A suitable labelling plate (not sticker) needs to be provided with ,inter alia ,following information:-
- Manufacturer's name
  - Make
  - Model
  - Month & year of manufacture
  - Rated speed
  - Rated pressure
  - Discharge rate
  - Power rating
  - Country of origin





**26.29 Safety provision/safety wear**

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

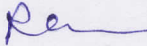

**27. TECHNICAL LITERATURE**

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	
P. K. PANDEY DIRECTOR	

**28. APPLICANT'S COMMENTS**

Para No	Our reference	Applicant's comments
28.1	26.1	We will mark each sprayer.
28.2	26.2	We will specify on each sprayer.
28.3	26.3,26.4,26.5	We will specify.
28.4	26.6,26.7,26.10, 26.13,26.14,26.15,26.26	We will improve.
28.5	26.8,26.17	We will provide.
28.6	26.9	We will change the strainer mesh.
28.7	26.11	We will try to implement.
28.8	26.12,26.18,26.19, 26.20,26.21,26.22, 26.24	Noted.
28.9	26.16,26.27	We will look into this.
28.10	26.25	Noted & we will improved.
28.11	26.29	We will provide in user's manual.

