



**SHAKTI SBS-500 e
BATTERY OPERATED KNAPSACK SPRAYER**



सत्यमेव जयते

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

1. Date of test : 12.05.2017
2. Atmospheric conditions :
 - a) Temperature : 35.6 °C
 - b) Relative humidity : 28.3 %
 - c) Pressure : 97.6 kPa
3. Data recorded

Speed of Pump (rpm)	Working 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)
3122	1.0	1	2600	Nil	2607.5	2607.5
		2	2600			
		3	2610			
		4	2620			
2924	2.0	1	2250	Nil	2247.5	2247.5
		2	2230			
		3	2250			
		4	2260			
2827	3.0	1	1690	Nil	1687.5	1687.5
		2	1700			
		3	1680			
		4	1680			
2744	4.0	1	1450	Nil	1457.5	1457.5
		2	1450			
		3	1470			
		4	1460			

Minimum discharge rate = 1457.5 ml/min at 4 kg/cm²
 Maximum discharge rate = 2607.5 ml/min at 1 kg/cm²
 Discharge at rated pressure = 1687.5 ml/min at 3 kg/cm²

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

Rated pressure, kg/cm² : 3
 Discharge of water at rated pressure, l/min : 1.678
 Discharge of water at no-load, l/min : 2.958
 Pump speed at no-load, rev/min : 3187
 Pump speed at rated pressure, rev/min : 2836
 Volumetric efficiency of pump, % : 63.75

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

Cl. 8.2	The exposed mild steel parts shall have a protective coating to prevent surface deterioration. The steel used for hose ferrule/clip shall be plated with cadmium, zinc or nickel exposed brass parts may be given a suitable protective finish with clear transparent lacquer.	Metallic part are coated with enamel paint.	Conforms
Cl. 9 Marking & Packing Cl. 9.1 Marking	Each sprayer shall be marked with the following particulars		
	a) Manufacturer's name or recognized trade mark	Shakti Agro Industries, 2153/1, Radha Swami Road, St. No. 6, Arjun Nagar, Gill Road, Ludhiana-141003 (Pb) India	Conforms
	b) Batch or Serial No.	BS16/55	Conforms
	c) Tank nominal capacity	16 ltr.	Conforms
Cl.9.3 IS:3906-1995 Packing	Each sprayer shall be packed as agreed to between the purchase and the supplier for safe handling in transit.		

15. 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:3652-1995 : **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 Serial number of battery is not marked. It should be marked.
- 16.2 Battery charger country of origin is not marked. It should be marked.
- 16.3 The material of pump inlet port end fitting does not conform to the requirement of Indian Standard. It should be improved.
- 16.4 The serial number of motor is not specified. It should be specified.
- 16.5 Pump serial number, country of origin and rated speed of pump is not marked. It should be marked.
- 16.6 The strainer in cut-off device is not provided. It should be provided.
- 16.7 The strainer in nozzle is not provided. It should be provided.

- 16.8 The cut-off device and spray lance batch or code number is not marked. It should be marked.
- 16.9 The volumetric efficiency of pump does not meet the requirement of Indian Standard. It **MUST** be improved.
- 16.10 The maximum trigger actuation torque is 60.50 kgf-cm. This exceeds the limit specified by Indian Standard. It **MUST** be improved.
- 16.11 Agitator is not provided. It may be provided.
- 16.12 Metallic threaded connection provided on sprayer does not meet the requirements of Indian Standard. It **MUST** be looked into.
- 16.13 The strap width and strap cushion thickness does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.14 The current drawn by motor at no load and on load was observed as 0.72 and 1.4 A respectively which does not conform to requirement of IS- 14459: 1997.
- 16.15 Time required to full charge the battery with AC charger is observed as 7^{1/2} to 9 hours.
- 16.16 The spraying operation time after fully charging the battery was observed as 7 to 8 hours.
- 16.17 During the pump chamber hydraulic test the motor stopped at 6.0 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.
- 16.18 The discharge rate of nozzle for jet spray pattern does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.19 The nozzle designation does not meet the requirement of Indian Standard. It **MUST** be improved.
- 16.20 The nozzle batch or code number is not marked. It **MUST** be marked.
- 16.21 The spray angle of nozzle at cone spray is not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.22 A suitable labelling 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

