

व्यावसायिक परीक्षण रिपोर्ट

संख्या/ No.: PS-468/2645/2021

COMMERCIAL TEST REPORT (FIRST BATCH)

माह/Month : January, 2021

THIS TEST REPORT VALID UP TO : 31st January, 2026



**SHAKTI, SBS – 500 S
BATTERY OPERATED KNAPSACK SPRAYER
(FIRST BATCH)**



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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	-Nipple	Brass, Engineering plastic, stainless steel,	Brass	Conforms
	-Valve	Brass, synthetic rubber, plastic, stainless steel	Synthetic rubber	Conforms
	-Strainer	Brass, stainless steel, plastic	NA	--
	-Operating knob	Brass, Engineering plastic	Not applicable	--
	- Operating trigger	Steel, Engineering plastic	Steel	Conforms
	-Spring	Stainless steel,	Stainless steel	Conforms
	-Gasket	Synthetic rubber, fiber, PVC	Fiber	Conforms
	-Gland seal	PVC	Not applicable	--
	-Gland packing	Asbestos rope	Asbestos rope	Conforms
xxxiii)	Material of construction of various components as per IS: 3906-1995			
	Strap	Woven web cotton/synthetic yarn	Synthetic yarn	Conforms
	Skirt/Stand	Steel, plastic	Plastic	Conforms
	Strap buckle	Steel, Engg. Plastic	Steel	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 by the manufacturer	Conforms

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

1. Date of test : 06.01.2021
2. Atmospheric conditions :
 - a) Temperature : 18.8 °C
 - b) Relative humidity : 54.6 %
 - 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)
3131	1.0	1	2760	NIL	2752.5	2752.5
		2	2740			
		3	2750			
		4	2760			

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2750	3.0	1	1980	NIL	1985.0	1985.0
		2	2000			
		3	1970			
		4	1990			
2712	4.5	1	1650	NIL	1650.0	1650.0
		2	1660			
		3	1640			
		4	1650			
2663	6.0	1	1230	NIL	1470.0	1470.0
		2	1260			
		3	1240			
		4	1250			

Minimum discharge rate = 1470.0 ml/min at 6 kg/cm²
 Maximum discharge rate = 2752.5 ml/min at 1 kg/cm²
 Discharge at rated pressure = 1985.0 ml/min at 3 kg/cm²

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

Date of Test : 06.01.2021
 Rated pressure, kg/cm² : 3
 Avg. discharge of water at rated pressure, ml/min : 1985
 Avg. discharge of water at no-load, ml/min : 3960
 Avg. pump speed at no-load, rev/min : 3369
 Avg. pump speed at rated pressure, rev/min : 2750
 Volumetric efficiency of pump, % : 61.4

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

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

Date of test : 06.01.2021
 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 : 1.05 A
 3. Avg. current drawn by motor at load : 2.40 A
 4. Avg. motor operating voltage : 12.74 V
 5. Avg. observed motor power requirement : 30.57 watt
 6. Avg. motor speed at no load : 3369 rpm
 7. Avg. motor speed at load : 2750 rpm
 8. Avg. time required for fully discharge of battery : 8 to 9 h
 9. Avg. No load rpm of motor after 6 hours of operation : 3010 rpm

Cl.8 Workmanship & Finish	The components of the sprayer shall have a smooth finish and shall be free from pits burrs, sharp edges and other defects that may be detrimental for their use.	Satisfactory	Conforms
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 is coated with enamel paint.	Conforms
Cl. 9 Marking & Packing	Each sprayer shall be marked with the following particulars		
Cl. 9.1 Marking	a)Manufacturers name or recognized trade mark	Shakti Agro Industries, SBS-500 S	Conforms
	b)Batch or serial no.	BS-110/20-3	Conforms
	c)Tank nominal capacity	16 lt.	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.		

16. CRITICAL TECHNICAL SPECIFICATIONS

(Deferred till 31.03.2021 vide Ministry's O.M. No 13-13/2020 M &T (I & P) dated 22.12.2020)

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

18. COMMENTS & RECOMMENDATIONS	
18.1	The country of origin of battery charger is not specified. It should be specified
18.2	The volumetric efficiency of pump does not meet the requirement of Indian standard. It MUST be improved.
18.3	The country of origin of pump is not specified. It should be specified.
18.4	The strainer in cut-off device is not provided. It MUST be looked into.
18.5	The strainer in nozzle is not provided. It may be considering for providing.
18.6	The country of origin and serial number of battery is not specified. It MUST be looked into.
18.7	Agitator is not provided. It may be provided.
18.8	Time required to full charge the battery with AC charger is observed as 7 to 8 hours.
18.9	The spraying operation time after fully charging the battery was observed as 7 to 8.5 hours.

18.10	Spray angle of nozzle at 300 kPa pressure does not conform to the requirement of IS: 3652-1995. It MUST be looked into.
18.11	The average aperture size of filling hole strainer does not meet the requirement of Indian Standard. It MUST be looked into.
18.12	A suitable labeling plate (Not sticker) needs to be provided with “interalia” 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
18.13	Safety provision/Safety wear The safety instructions regarding handling poisonous agrochemical before, during and after spraying operation should be provided on sprayer.

19. TECHNICAL LITERATURE

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

- i. Operator’s cum service manual
- ii. Parts list

However, the manual of sprayer should be updated as per IS: 8132-1999.

20. COMPARISON WITH SPECIFICATION OF PREVIOUS SAMPLE

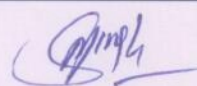
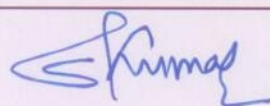

(Test report No. PS-174/1814/ 2016, January, 2016) of NRFMT&TI, Hisar and PRESENT SAMPLE

SI No.	Parameter		Previous Sample	Present Sample
1	2		3	4
20.1	Specifications			
20.1.1	General			
	Type	:	Battery operated knapsack sprayer	Battery operated knapsack sprayer
	Make	:	Shakti	Shakti
	Model	:	SBS- 500 S	SBS- 500 S
	Serial No.	:	Not specified	BS-110/20-3
	Name of manufacturer(apa)		Shakti Agro Industries, 2153/1, Radha Swami Road, St. No. 6, Arjun Nagar, Gill Road, Ludhiana-141003 (PB)	
	Capacity of sprayer, l		16	16
	Working pressure, kg/cm ² (apa)	:	6.8	1 to 6
	Year of manufacture	:	Not specified	September, 2020

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20.1.6	Chemical Tank		
	Material	:	- Plastic
	Capacity (l)	:	- 16
	Overall size, mm (HxWxL)	:	- 389 x 185 x 390
	Location	:	- Above battery, motor and pump mounting
20.1.7	Agitating Device	:	- Not provided
20.1.8	Nozzle		
	Type (apa)	:	- Adjustable, double action
	Nozzle designation	:	- A 85 1350 2200
	Number of nozzle	:	- One
20.1.9	Mounting Arrangement		- Battery, motor and pump is mounted beneath the chemical tank
20.1.10	Safety wear (for operator's safety during operation)		Provided Mask, goggle and hand gloves are provided.
20.1.11	Overall Dimensions, mm		
	Height	:	455 470
	Width	:	185 185
	Length	:	410 390
20.1.12	Total mass, kg	:	6.300 6.0
	Mass with full chemical tank, (kg)	:	- 22.0
20.1.13	Technical literature	:	Operating instructions and parts list Operator cum service manual and parts list.

TESTING AUTHORITY

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
SANJAY KUMAR AGRICULTURAL ENGINEER	
P. K. PANDEY DIRECTOR	

21. APPLICANT'S COMMENTS

“We will follow comments and recommendations of test report in our production and testing process”