व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

संख्या/ **No.: PS-283/2011/2017**

माह/**Month : July, 2017**

SHAKTI SBS-520 S
BATTERY CUM HAND 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

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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.	Declared in the specification sheet.	Conforms

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

1. Date of test : 08.05.2017
2. Atmospheric conditions :
   a) Temperature : 37.3 °C
   b) Relative humidity : 40.5 %
   c) Pressure : 97.8 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)
3556	1.0	1	3020	NIL	3017.5	3017.5
		2	3040			
		3	3000			
		4	3010			
3364	2.0	1	2450	NIL	2435.0	2435.0
		2	2420			
		3	2430			
		4	2440			
3293	3.0	1	2050	NIL	2037.5	2037.5
		2	2060			
		3	2030			
		4	2010			
3275	4.0	1	1600	NIL	1605.0	1605.0
		2	1620			
		3	1590			
		4	1610			

Minimum discharge rate = 1605.0 ml/min at 4.0 kg/cm^2
Maximum discharge rate = 3017.5 ml/min at 1.0 kg/cm^2
Discharge at rated pressure = 2037.5 ml/min at 3.0 kg/cm^2

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

Date of test	:	08.05.2017
Rated pressure, kg/cm^2	:	3
Discharge of water at rated pressure, l/min	:	2.045
Discharge of water at no load, l/min	:	3.255
Pump speed at no load, rev/min	:	3664
Pump speed at rated pressure, rev/min	:	3291
Volumetric efficiency of pump, %	:	69.95

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

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

The power requirement of DC motor fitted on sprayer was observed as following.

1. Avg. motor operating voltage	:	12 V
2. Avg. current drawn by motor at no load	:	1.1 A
3. Avg. current drawn by motor at load on rated pressure	:	1.8 A
4. Avg. motor operating voltage at rated pressure	:	12.6 V
5. Avg. observed motor power requirement at rated pressure	:	22.73 Watt
6. Motor speed at no load	:	3635 rpm
7. Motor speed at on load, rated pressure	:	3294 rpm
8. Time required for fully discharge of battery	:	8.0 to 8.30 hr.
9. No load rpm of motor after 6 hours of operation	:	2940 rpm

6. PRESSURE ADJUSTMENT TEST
(Vide Clause 8.7.1 of IS – 11313 : 2007)

1. Date of test : 08.05.2017
2. Atmospheric conditions :
   a. Temperature : 37.5 °C
   b. Relative humidity : 34.9 %
   c. Pressure : 97.4 kPa
3. Data recorded

S. No.	Working pressure (kg/cm^2)	Fluctuation range (kg/cm^2)	Pressure drop (kg/cm^2)	Ratio
1.	1.0	NIL	NIL	--
2.	2.0	NIL	NIL	--
3.	3.0	NIL	NIL	--
4.	4.0	NIL	NIL	--

4. Resistance of pressure: Yes

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

Date of test	:	07.4.2017
Type	:	Gooseneck (Type B_1)

24. CONFORMITY TO INDIAN STANDARDS

i)	IS: 11313:2007 Hydraulic power sprayers-specification	:	**Does not conform in toto**
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**
vi)	IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation	:	**Does not conform in toto**

25. COMMENTS & RECOMMENDATIONS

25.1 The sprayer serial number is not marked. It should be marked.

25.2 The motor serial number, motor power and rated speed is not specified. It should be specified.

25.3 The battery serial number and country of origin is not specified. It should be specified.

25.4 Country of origin of battery charger is not marked. It should be marked.

25.5 The country of origin of pump is not specified. It should be specified.

25.6 The dimension of straps does not meet the requirements of Indian Standard. It **MUST** be looked into.

25.7 The metallic threaded connection provided on sprayer does not meet the requirement of Indian Standard. It **MUST** be looked into.

25.8 The batch or code number on nozzle is not provided. It **MUST** be looked into.

25.9 The strap cushion thickness does not meet the requirement of Indian Standard. It **MUST** be looked into.

25.10 The spray angle of nozzle at 300 kPa pressure does not conform to the requirement of IS:3652-1995. It **MUST** be looked into.

25.11 The lance is not marked batch or code number. It **MUST** be marked.

25.12 The strainer is not provided in cut off device. It may be provided.

25.13 The trigger actuation force is observed more than as defined in Indian Standard. It should be examined & improved.

25.14 The strainer in nozzle is not provided. It should be provided.

25.15 Agitator is not provided in sprayer. It may be provided.

25.16 The material of pump inlet part end filling does not meet the requirement of Indian Standard.

25.17 The batch or code number of cut-off device is not marked. It should be marked.

25.18 Time required to full charge battery with AC charger is observed as 7.5 to 9.15 hours.

25.19 The spraying operation time after fully charging the battery was observed as 8.0 to 8.30 hours.

25.20 **The volumetric efficiency of sprayer on battery operated mode was observed as 69.95%, which is not within the requirement of the relevant Indian Standard.**

25.21 The current drawn by motor at no load and on load was observed as 1.1 A and 1.8 A respectively which does not conform to requirement of IS: 14459-1997.

25.22 The sprayer does not conform to the relevant standard in toto. It **MUST** be looked into.

25.23 The nozzle designation marked on nozzle does not meet the requirement of Indian Standard. It **MUST** be looked into.

25.24 During the pump chamber hydraulic test the motor stopped at 6.0 kg/cm^2 pressure against the pressure requirement of 7.5 kg/cm^2. Thus the sprayer does not meet the requirement of Indian Standard.

25.25 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