SHAKTI SBS-500 e
BATTERY OPERATED KNAPSACK SPRAYER

Government of India
Ministry of Agriculture and Farmers Welfare
Northern Region Farm Machinery Training and Testing Institute

Website: http://nrfmtti.gov.in/  
Tele./FAX: 01662-276984
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

<table>
<thead>
<tr>
<th>Speed of Pump (rpm)</th>
<th>Working pressure (kg/cm²)</th>
<th>Test No.</th>
<th>Delivery from the discharge line (ml/min)</th>
<th>Overflow</th>
<th>Average discharge from the discharge line (ml/min)</th>
<th>Discharge rate of pump (ml/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3122</td>
<td>1.0</td>
<td>1</td>
<td>2600</td>
<td>Nil</td>
<td>2607.5</td>
<td>2607.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>2600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>2610</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>2620</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2924</td>
<td>2.0</td>
<td>1</td>
<td>2250</td>
<td>Nil</td>
<td>2247.5</td>
<td>2247.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>2230</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>2250</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>2260</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2827</td>
<td>3.0</td>
<td>1</td>
<td>1690</td>
<td>Nil</td>
<td>1687.5</td>
<td>1687.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>1700</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>1680</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>1680</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2744</td>
<td>4.0</td>
<td>1</td>
<td>1450</td>
<td>Nil</td>
<td>1457.5</td>
<td>1457.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>1450</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>1470</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>1460</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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.

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

b) Batch or Serial No. BS16/55

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 observes 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 7½ 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