CHINA THUSHARA B 009
BATTERY OPERATED KNAPSACK SPRAYER

Government of India
Ministry of Agriculture and Farmers Welfare
Department of Agriculture, Cooperation and Farmers Welfare
Northern Region Farm Machinery Training and Testing Institute
Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001

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E-mail: fmti-nr@nic.in
Tele./FAX: 01662-276984
3. TEST FOR DISCHARGE RATE OF PUMP
(Vide Clause 8.3 of IS – 11313 : 2007)

1. Date of test : 12.07.2017
2. Atmospheric conditions :
   a) Temperature : 32 °C
   b) Relative humidity : 66 %
   c) Pressure : 97.1 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>3585</td>
<td>2.0</td>
<td>1</td>
<td>2450</td>
<td>Nil</td>
<td>2427.5</td>
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</tr>
<tr>
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<td></td>
<td>2</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>3</td>
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<tr>
<td></td>
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<tr>
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<td>Nil</td>
<td>2317.5</td>
<td>2317.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>2300</td>
<td></td>
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<tr>
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<td>2320</td>
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<tr>
<td></td>
<td></td>
<td>4</td>
<td>2330</td>
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<td>3536</td>
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<td>2200</td>
<td>Nil</td>
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<td></td>
<td></td>
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</tr>
<tr>
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</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>2220</td>
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<td></td>
</tr>
<tr>
<td>3527</td>
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<td>Nil</td>
<td>1620.0</td>
<td>1620.0</td>
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<td></td>
<td>2</td>
<td>1630</td>
<td></td>
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<tr>
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<tr>
<td></td>
<td></td>
<td>4</td>
<td>1620</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Minimum discharge rate = 1620.0 ml/min at 3 kg/cm²
Maximum discharge rate = 2427.5 ml/min at 2 kg/cm²
Discharge at rated pressure = 1620.0 ml/min at 3 kg/cm²

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

Rated pressure, kg/cm² : 3
Avg. discharge of water at rated pressure, l/min : 1.620
Avg. discharge of water at no-load, l/min : 2.850
Avg. pump speed at no-load, rev/min : 3768
Avg. pump speed at rated pressure, rev/min : 3527
Volumetric efficiency of pump, % : 61

15. 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
- iv) IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation
  - Does not conform in toto

16. COMMENTS & RECOMMENDATIONS

16.1 The serial number of sprayer is not marked. It should be marked.

16.2 The make of battery is not marked. It should be marked.

16.3 Battery charger make, model and country of origin is not marked. It should be marked.

16.4 The material of pump inlet port end fitting does not conform to the requirement of Indian Standard. It should be improved.

16.5 The serial number and rated speed of motor is not specified. It should be specified.

16.6 Pump make, model, rated speed, serial number and country of origin of pump is not marked. It should be marked.

16.7 The back rest cushion is not provided on sprayer. It should be Provided.
16.8 The accessories viz. mask, hand gloves and safety goggles for operator's safety are not provided with sprayer. It MUST be provided.

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

16.10 The cut-off device and spray lance is not marked. It MUST be marked.

16.11 The volumetric efficiency of pump does not meet the requirement of Indian Standard. It MUST be improved.

16.12 The maximum trigger actuation torque is 43.8 kgf-cm. This exceeds the limit specified by Indian Standard. It MUST be improved.

16.13 Agitator is not provided. It may be provided.

16.14 Metallic threaded connection provided on sprayer does not meet the requirements of Indian Standard. It MUST be looked into.

16.15 The strap width and strap cushion thickness does not meet the requirement of Indian Standard. It MUST be looked into.

16.16 The current drawn by motor at no load and on load was observed as 0.8 and 2.68 A respectively which does not conform to requirement of IS-14459:1997.

16.17 Time required to full charge the battery with AC charger is observed as 9.4 to 10.6 hours.

16.18 The spraying operation time after fully charging the battery was observed as 7.2 to 8.3 hours.

16.19 During the pump chamber hydraulic test the motor stopped beyond 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.

16.20 The discharge rate of nozzle for fine cone spray and jet spray pattern does not meet the requirement of Indian Standard. It MUST be looked into.

16.21 The nozzle designation is not marked. It MUST be marked.

16.22 The nozzle manufacturer's name or recognized trade mark, batch or cod number is not marked. It MUST be marked.

16.23 During the strap drop test the buckle/bracket of strap assembly found failed to hold the strap in its position. It should be improved.

16.24 The cut-off device strainer area is less than the requirement of Indian Standard. It should be improved.

16.25 The cut-off device strainer aperture opening is less than the requirement of Indian Standard. It should be improved.
16.26 A suitable labelling plate 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

17. TECHNICAL LITERATURE

No literature is supplied with the sprayer. The operator manual should be provided with sprayer as per IS: 8132-1999 with the inclusion of safety instructions regarding handling of poisonous chemicals, safety precaution before, during and after spraying.

TESTING AUTHORITY

<table>
<thead>
<tr>
<th>R. K. NEMA</th>
<th>P. K. PANDEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SENIOR AGRICULTURAL ENGINEER</td>
<td>DIRECTOR</td>
</tr>
</tbody>
</table>

18. APPLICANT'S COMMENTS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Our Reference Page/Clause No</th>
<th>Applicant’s Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.1</td>
<td>16/Cl.6.3.1</td>
<td>Noted for action. The width of strap will be made 38 mm.</td>
</tr>
<tr>
<td>18.2</td>
<td>17/6.13</td>
<td>The plastic pivot pin shall be replaced with riveted metal pin.</td>
</tr>
<tr>
<td>1.3</td>
<td>20/3.2</td>
<td>Strainer will be changed to correct area.</td>
</tr>
<tr>
<td>18.4</td>
<td>20/3.2.1</td>
<td>The aperture size will be changed to correct size.</td>
</tr>
<tr>
<td>18.5</td>
<td>21/6.2</td>
<td>This will be attended.</td>
</tr>
<tr>
<td>18.6</td>
<td>22/F 4.1</td>
<td>Strainer aperture size will be corrected.</td>
</tr>
<tr>
<td>18.7</td>
<td>23/7.3.1</td>
<td>The thickness will be increased to 20 mm for strap cushion.</td>
</tr>
<tr>
<td>18.8</td>
<td>23/7.3.2</td>
<td>The thickness will be increased to 20 mm for backrest cushion.</td>
</tr>
</tbody>
</table>