COMMERCIAL TEST REPORT

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BATTERY CUM HAND OPERATED KNAPSACK SPRAYER
VIJAY KRUSHI, VKA 18C-2 AIRAVAT

Goverment 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
[ISO 9001:2015 CERTIFIED]

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3. RUNNING - IN

Though the applicant has not recommended running-in, with the consent of the applicant the running-in of the sprayer was conducted for one hour in order to overcome variation in initial performance. Lubrication and the adjustment of the components were done as per applicant’s recommendation.

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

1. Date of test : 16.01.2018
2. Atmospheric conditions:
   a) Temperature : 23 °C
   b) Relative humidity : 45%
   c) Pressure : 99.0 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>2952</td>
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<td>2430</td>
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<tr>
<td>2668</td>
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<td>1750</td>
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<td>4</td>
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<tr>
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</tr>
</tbody>
</table>

Minimum discharge rate = 1475.0 ml/min at 4.0 kg/cm²
Maximum discharge rate = 2425.0 ml/min at 2 kg/cm²
Discharge at rated pressure = 1745.0 ml/min at 3.0 kg/cm²
5. TEST FOR VOLUMETRIC EFFICIENCY
(Vide Clause 8.4 of IS : 11313 - 2007)

Date of test : 17.01.2018
Rated pressure, kg/cm² : 3 kg/cm²
Avg. discharge of water at rated pressure, l/min : 1.750
Avg. discharge of water at no load, l/min : 2.957
Avg. pump speed at no load, rev/min : 3132
Avg. pump speed at rated pressure, rev/min : 2667
Volumetric efficiency of pump, % : 70%

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

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

The 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 : 0.78A
3. Avg. current drawn by motor at load : 1.64A
4. Avg. motor operating voltage : 12.72V
5. Avg. observed motor power requirement : 20.81Watt
6. Avg. motor speed at no load : 3132 rpm
7. Avg. motor speed at on load : 2643
8. Avg. Time required for fully discharge of battery : 8.0 to 8.3 Hour

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

1. Date of test : 16.02.2018
2. Atmospheric conditions :
   a. Temperature : 23 °C
   b. Relative humidity : 45 %
   c. Pressure : 99.0 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Working pressure (kg/cm²)</th>
<th>Fluctuation range (kg/cm²)</th>
<th>Pressure drop (kg/cm²)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>2.</td>
<td>2.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>3.</td>
<td>3.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>4.</td>
<td>4.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
</tbody>
</table>

4. Resistance of pressure: Yes
25. 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

26. COMMENTS & RECOMMENDATIONS

26.1 The sprayer year of manufacture is not marked. It should be marked.

26.2 The battery model and country of origin is not specified. It should be specified.

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

26.4 The Serial number and country of origin of pump is not specified. It should be specified.

26.5 The material used for spray nozzles does not meet the requirements of Indian Standard. It MUST be looked into.

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

26.7 The material used for pump inlet port end fitting does not meet the requirements of Indian standard. It MUST be looked into.

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

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

26.10 The tank capacity of sprayer does not meet the requirement of IS : 3906-1995. It MUST be looked into.

26.11 The length of discharge outlet does not meet the requirements of Indian standard. It MUST be looked into.

26.12 The strap cushion thickness does not meet the requirement of Indian standard. It MUST be looked into.

26.13 The lance is not marked with batch or code number. It MUST be marked

26.14 The material used for handle and operating level does not meet the requirement of Indian standard. It MUST be looked into.
26.15 The cut off device is not marked. It must be marked.

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

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

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

26.19 Time required to full charge battery with AC charger is observed as 8.0 to 8.3 hours.

26.20 The spraying operation time after fully charging the battery was observed as 7.4 to 7.5 hours.

26.21 The current drawn by motor at no load and on load was observed 0.78 to 1.64 Amp respectively which does not conform to requirement of IS : 14459 : 1997.

26.22 The volumetric efficiency of sprayer on battery operated mode was observed as 70 %, which is not within the requirement of the relevant Indian Standard.

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

26.24 The nozzle is not marked. It should be marked.

26.25 During the pump chamber hydraulic test the motor stopped beyond 5.0 kg/cm² pressure against the pressure requirement of 7.5 kg/cm². Thus the sprayer does not meet the requirement of Indian Standard.

26.26 The operating lever of sprayer distorted during test. It should be examined & improved.

26.27 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

26.28 The tank capacity of sprayer does not meet the requirement of Indian Standard. It MUST be looked into.