BATTERY CUM HAND OPERATED KNAPSACK SPRAYER CHAKRADHAR CHEMICALS, BALWAN

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

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

1. Date of test : 15.05.2018
2. Atmospheric conditions :
   a) Temperature : 34.5°C
   b) Relative humidity : 26%
   c) Pressure : 97.8 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>
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<td>4</td>
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</table>

Minimum discharge rate = 1530.0 ml/min at 4.0 kg/cm²
Maximum discharge rate = 2460.0 ml/min at 1 kg/cm²
Discharge at rated pressure = 1787.5 ml/min at 3.0 kg/cm²

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

Date of test : 15.05.2018
Rated pressure, kg/cm² : 3 kg/cm²
Avg. discharge of water at rated pressure, l/min : 1.795
Avg. discharge of water at no load, l/min : 3.100
Avg. pump speed at no load, rev/min : 3373
Avg. pump speed at rated pressure, rev/min : 2932
Volumetric efficiency of pump, % : 67

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

26. COMMENTS & RECOMMENDATIONS

26.1 The material of pump inlet port end fitting does not meet the requirement of Indian Standard. It MUST be looked into.

26.2 Material used for different component is not declared. It should be declared.

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

26.4 The motor make, serial number and power is not specified. It should be specified.

26.5 The make, model and country of origin of charger is not specified. It should be specified.

26.6 Make, Model and country of origin of pump is not specified. It should be specified.

26.7 Country of origin of battery is not specified. It should be specified.

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

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

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

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

26.12 The strainer area of cut off device does not meet the requirement of Indian standard. It MUST be looked into.

26.13 The spray angle of nozzle at 300 kPa pressure does not conform to the requirement of IS: 3652-1995. It MUST be looked into.
The lance is not marked with batch or code number. It MUST be marked.

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

The spare parts are not provided during the test. It MUST be provided.

The operating lever of the sprayer distorted during the operating lever, handle & piston rod test. It MUST be looked into.

The discharge rate of nozzle at a pressure of 300 kPa for fine cone spray pattern does not conform to the requirement of IS: 3652-1995.

The cut off device is not marked. It MUST be marked.

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

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

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

Time required to full charge battery with AC charger is observed as 8.25 hours.

The spraying operation time after fully charging the battery was observed as 7.08 hours.

The current drawn by motor at no load and on load was observed 0.90 to 1.80 Amp. respectively which does not conform to requirement of IS: 14459:1997.

The volumetric efficiency of sprayer on battery operated mode was observed as 67 %, which is not within the requirement of the relevant Indian Standard.

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

The nozzle is not marked. It should be marked.

During the pump chamber hydraulic test the motor stopped beyond 6.0 kg/cm² pressure against the pressure requirement of 7.5 kg/cm². Thus the sprayer does not meet the requirement of Indian Standard.

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

26.31 Safety provision/Safety wear.  
i) The accessories viz. Mask, hand gloves for operators safety has not been provided with sprayer. It should be provided.

ii) Safety instructions regarding handling poisonous agro-chemical & safety precautions before, during and after operation mas be added in operators manual.

27. TECHNICAL LITERATURE

The user manual of sprayer was provided during the test which found inadequate. The user manual should be update as per IS: 8132:1999, with the inclusion of safety instructions regarding handling poisonous agrochemical before, during and after spraying operation.

TESTING AUTHORITY

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

28. APPLICANT'S COMMENTS

In response to draft test report the applicant has commented as 'Report is O.K'.