SOUTHERN AGRO ENGINE PVT. LTD. VIJAY PANKH
VIJAY VILLIERS, HAND 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
[ISO 9001:2015 CERTIFIED]

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Tele./FAX: 01662-276984
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 was done as per applicants recommendation.

4. TEST FOR DISCHARGE RATE
(Vide Clause 6.1.3 of IS 10134-1994)

1. Date of test : 03.07.2018
2. Atmospheric conditions :
   a) Temperature : 31 °C
   b) Relative humidity : 71 %
   c) Pressure : 97.5 KPa

3. Data recorded

<table>
<thead>
<tr>
<th>No. of hand strokes per minute</th>
<th>Pressure (kPa)</th>
<th>Test No.</th>
<th>Delivery from the discharge line (ml/min)</th>
<th>Overflow (ml/min)</th>
<th>Average delivery from the discharge line (ml/min)</th>
<th>Discharge rate of pump (ml/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>300</td>
<td>1</td>
<td>140</td>
<td>Nil</td>
<td></td>
<td>147.5</td>
</tr>
<tr>
<td>16</td>
<td>300</td>
<td>2</td>
<td>160</td>
<td>Nil</td>
<td></td>
<td>147.5</td>
</tr>
<tr>
<td>16</td>
<td>300</td>
<td>3</td>
<td>150</td>
<td>Nil</td>
<td></td>
<td>147.5</td>
</tr>
<tr>
<td>16</td>
<td>300</td>
<td>4</td>
<td>140</td>
<td>Nil</td>
<td></td>
<td>147.5</td>
</tr>
</tbody>
</table>

Average discharge rate : 147.5 ml/min at 300 kPa pressure
5. TEST FOR VOLUMETRIC EFFICIENCY  
(Vide Clause 6.2 of IS 10134-1994)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Details</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Discharge of water in one minute, ml</td>
<td>147.5</td>
</tr>
<tr>
<td>2</td>
<td>No of cycle in one minute</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Actual volume of water in one cycle</td>
<td>9.22</td>
</tr>
<tr>
<td>4</td>
<td>Inner diameter of pump cylinder, mm</td>
<td>43.42</td>
</tr>
<tr>
<td>5</td>
<td>Stroke length at 300 kPa pressure, mm</td>
<td>24.46</td>
</tr>
<tr>
<td>6</td>
<td>Piston displacement</td>
<td>36.23 cc</td>
</tr>
<tr>
<td>7</td>
<td>Theoretical volume of water in one cycle</td>
<td>36.23 ml</td>
</tr>
<tr>
<td>8</td>
<td>Volumetric efficiency, %</td>
<td>25%</td>
</tr>
</tbody>
</table>

Remarks: The volumetric efficiency does not conform to the requirement of IS: 10134-1994

6. TEST FOR SPRAY LANCE  

Date of test : 20.06.2018  
Type : Gooseneck (Type B1)

6.1 STRENGTH OF SPRAY LANCE

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Details</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Test Condition</td>
<td>Outlet closed</td>
</tr>
<tr>
<td>2</td>
<td>Hydraulic pressure applied</td>
<td>1 MPa</td>
</tr>
<tr>
<td>3</td>
<td>Duration of pressure retained</td>
<td>5 minutes</td>
</tr>
<tr>
<td>4</td>
<td>Result</td>
<td>No leak, crack, or burst of lance was observed during test</td>
</tr>
</tbody>
</table>

6.2 MARKING ON SPRAY LANCE

Manufacturer’s name or recognized trade mark : Not provided  
Batch or code number : Not marked  
Nominal length, mm : Not provided

7. TEST FOR CUT-OFF DEVICE  
(Vide Annex C Clause 6.8.3 of IS: 3652 : 1995)

Date : 21.06.2018  
Type : Trigger type (Type – A)

7.1 MAXIMUM TRIGGER ACTUATION TORQUE

Required torque : Observed torque  
Less than 35 Kgf-cm : 21.40 kgf-cm

7.2 STRENGTH TEST FOR CUT-OFF DEVICE

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Details</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Condition of outlet</td>
<td>Closed</td>
</tr>
<tr>
<td>2</td>
<td>Hydraulic pressure</td>
<td>750 kPa</td>
</tr>
<tr>
<td>3</td>
<td>Duration of pressure retained</td>
<td>5 Minute</td>
</tr>
<tr>
<td>4</td>
<td>Observation</td>
<td>No leakage, crack or burst of cut off device was observed during test</td>
</tr>
</tbody>
</table>
15. CONFORMITY TO INDIAN STANDARDS

i) IS: 10134-1994-Method of test for manually operated sprayer : Does not conform in toto

ii) Spray nozzle and spray gun as per IS:3652-1995 (Reaffirmed 2011) : Does not conform in toto

iii) IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the thread-dimensions, tolerance and designation : Conforms

16. COMMENTS & RECOMMENDATIONS

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

16.2 The volumetric efficiency of pump does not meet the requirement of Indian Standard. It MUST be looked into.

16.3 The manufacturer’s name or recognized, batch or code number and nominal length on spray lance is not marked. It MUST be looked into.

16.4 The manufacturer’s name or recognized trade mark, batch or code number and type of cut-off device not marked on spray lance. It MUST be looked into.

16.5 The Strainer is not provided in the nozzle. It may be provided.

16.6 The nozzle designation is not marked on nozzle. It MUST be marked.

16.7 The batch or code number of nozzle is not marked. It MUST be marked.

16.8 The discharge rate of fine cone spray & jet spray pattern of nozzle at a pressure of 300 kPa does not conform to the requirement of IS:3652-1995. It MUST be looked into.

16.9 The spray angle for fine cone spray pattern of nozzle at a pressure of 300 kPa does not conform to the requirement of IS:3652-1995. It MUST be looked into.

16.10 A filling hole diameter of sprayer does not conform to the requirement of IS:3906-1995. It MUST be looked into.

16.11 Strap cushion is not provided. It should be provided.

16.12 The percentage variation of nozzle at fine cone pattern during endurance test exceeds the prescribe limit. It MUST be looked into.

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

16.14 No spare parts was provided with the sprayer. It should be provided.

16.15 The back rest cushion is not provided. It should be provided.

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

16.17 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 pressure
   vi. Discharge rate
   vii. Country of origin
16.18 Safety provision/safety wear
   
i) Safety wear for operator’s safety during operation was not provided. It **MUST** be provided.

   ii) Safety instructions regarding handling poisonous agrochemicals before, during and after spraying operation should be provided on sprayer

17. TECHNICAL LITERATURE

No literature was supplied with the sprayer. It is recommended to provide operator’s manual service manual & parts catalogue for guidance of user.

The operator manual should contain safety instructions regarding handling poisonous agro chemicals before, during and after spraying operation.

TESTING AUTHORITY

| R. K. NEMA          |   |
| SENIOR AGRICULTURAL ENGINEER |

| P. K. PANDEY         |   |
| DIRECTOR             |

18. APPLICANT’S COMMENTS

No comments received from applicant.