HAND OPERATED KNAPSACK SPRAYER
VIJAY KRUSHI GROWTH PLUS VKA/017A

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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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 : 23.12.2017
2. Atmospheric conditions :
   a) Temperature : 18 °C
   b) Relative humidity : 55 %
   c) Pressure : 99.4KPa
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</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>630</td>
<td>Nil</td>
<td>632.5</td>
<td>632.5</td>
</tr>
<tr>
<td>16</td>
<td>300</td>
<td>2</td>
<td>630</td>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>300</td>
<td>3</td>
<td>630</td>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>300</td>
<td>4</td>
<td>630</td>
<td>Nil</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average discharge rate : 632.5 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>:</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Discharge of water in one minute</td>
<td>:</td>
<td>632.5ml</td>
</tr>
<tr>
<td>2.</td>
<td>No of cycle in one minute</td>
<td>:</td>
<td>16</td>
</tr>
<tr>
<td>3.</td>
<td>Actual volume of water in one cycle</td>
<td>:</td>
<td>39.53 ml</td>
</tr>
<tr>
<td>4.</td>
<td>Inner diameter of pump cylinder</td>
<td>:</td>
<td>45.06 mm</td>
</tr>
<tr>
<td>5.</td>
<td>Stroke length at 300 kPa pressure</td>
<td>:</td>
<td>27.51 mm</td>
</tr>
<tr>
<td>6.</td>
<td>Piston displacement</td>
<td>:</td>
<td>43.88 cc</td>
</tr>
<tr>
<td>7.</td>
<td>Theoretical volume of water in one cycle</td>
<td>:</td>
<td>43.88 ml</td>
</tr>
<tr>
<td>8.</td>
<td>Volumetric efficiency, %</td>
<td>:</td>
<td>90</td>
</tr>
</tbody>
</table>
C-6.2 When tested in accordance with the method given in C 6.2.1 to 6.2.7, the maximum torque required for trigger actuation shall not be more than 3.5 N-m (35 Kgf-cm). The maximum trigger actuation torque is 15.59 Kgf-cm. Conforms

C-6.3 The operating knob in Type B cut-off device shall be suitably shaped for convenient handling. Not applicable

C-7 TESTS The cut-off device shall withstand the strength test and leakage and reliability test as given in C-8 and C-9.

C-8.4 During this test, the cut-off device shall not crack or burst. No crack or burst of cut off device observed at the application of 750 kPa hydraulic pressure for 5 minutes. Conforms

C-9 Leakage and reliability test as per IS 3652:1995 C-9.3.5 The cut-off device or spray gun shall be deemed to have passed this test, if it does not drip or leak through the valve. No sign of leakage through the valve observed after 5000 cycles at 300±30 kPa and 500 cycles of 600 ±60 kPa pressure. Conforms

C-10 MARKING Each cut-off device shall be marked with the following particulars:

a) Manufacturer’s name or recognized trade-mark, Not marked Does not conform

b) Batch or code number, and Not marked Does not conform

c) Type of cut-off device. Not marked Does not conform

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 threads-dimensions, tolerance and designation --

16. COMMENTS & RECOMMENDATIONS

16.1 The material used for different components is not declared by the manufacturer. It should be declared.

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

16.3 Material of handle, operating lever and handle pivot does not meet the requirement of Indian Standard. It MUST be looked into.

16.4 Material of Hose ferrule/clip does not meet the requirement of Indian standard. It MUST be looked into.
16.5 The Agitator is not provided. It should be provided.
16.6 The manufacturer's name or recognized, batch or code number and nominal length on spray lance is not marked. It MUST be looked into.
16.7 The manufacturer's name or recognized, batch or code number and type of cut-off device not marked on spray lance. It MUST be looked into.
16.8 The Strainer is not provided in the nozzle. It may be provided.
16.9 The nozzle designation is not marked on nozzle. It MUST be marked.
16.10 The batch or code number of nozzle is not marked. It MUST be marked.
16.11 The Cross sectional area of passage in valve body does not meet the requirement of Indian standard. It must be looked into.
16.12 The Strainer area of cut off device does not meet the requirement of Indian standard. It MUST be looked into.
16.13 The angle of spray lance does not meet the requirement of Indian Standard. It MUST be looked into.
16.14 The strap cushion is not provided. It should be provided.
16.15 During the strap drop test the buckle/bracket of strap assembly found failed to hold the strap in its position. It should be improved.
16.16 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

17. TECHNICAL LITERATURE

The operator manual, specification sheet was provided during the test which was found adequate, however, the literature should be updated as per IS: 8132:1999, with the inclusion of safety instructions regarding handling poisonous agrochemical and first aid.

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>

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