THUSARA-002
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

Website: http://nrfmtti.gov.in/
E-mail: fmti-nr@nic.in
THUSHARA-002
HAND OPERATED KNAPSACK SPRAYER (COMMERCIAL)

- Gasket: Synthetic rubber, fibre, leather, PVC
- Gland packing: Asbestos rope

<table>
<thead>
<tr>
<th>Clause No.</th>
<th>Specified requirement</th>
<th>Observations</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cl. 4.4 IS 3906:1995</td>
<td>The material used for different components shall be declared by the manufacturer in the manual.</td>
<td>Declared in the specification sheet.</td>
<td>Conforms</td>
</tr>
</tbody>
</table>

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: 31.08.2017
2. Atmospheric conditions:
   a) Temperature: 32 °C
   b) Relative humidity: 59 %
   c) Pressure: 97.6 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>420</td>
<td>Nil</td>
<td>412.5</td>
<td>412.5</td>
</tr>
<tr>
<td>16</td>
<td>300</td>
<td>2</td>
<td>400</td>
<td>Nil</td>
<td>412.5</td>
<td>412.5</td>
</tr>
<tr>
<td>16</td>
<td>300</td>
<td>3</td>
<td>410</td>
<td>Nil</td>
<td>412.5</td>
<td>412.5</td>
</tr>
<tr>
<td>16</td>
<td>300</td>
<td>4</td>
<td>420</td>
<td>Nil</td>
<td>412.5</td>
<td>412.5</td>
</tr>
</tbody>
</table>

Average discharge rate: 412.5 ml/min at 300 kPa pressure

5. TEST FOR VOLUMETRIC EFFICIENCY
(Vide Clause 6.2 of IS 10134-1994)
Date of test: 03.09.2017

<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</td>
<td>:</td>
</tr>
<tr>
<td>2.</td>
<td>No of cycle in one minute</td>
<td>:</td>
</tr>
<tr>
<td>3.</td>
<td>Actual volume of water in one cycle</td>
<td>:</td>
</tr>
<tr>
<td>4.</td>
<td>Inner diameter of pump cylinder</td>
<td>:</td>
</tr>
<tr>
<td>5.</td>
<td>Stroke length at 300 kPa pressure</td>
<td>:</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 threads-dimensions, tolerance and designation: Does not conform in toto

16. COMMENTS & RECOMMENDATIONS

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

16.2 The agitator is not provided. It should be provided.

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 The material of cushion does not meet the requirement of Indian Standard. It MUST be looked into.

16.5 Material of spray lance does not meet the requirement of Indian Standard. It MUST be looked into.

16.6 The material of spring of cut-off device does not meet the requirement of Indian Standard. It MUST be looked into.

16.7 The volumetric efficiency of sprayer was observed as 79 %, which is not within the requirement of relevant Indian Standard.

16.8 The spray lance is not marked. It MUST be marked.

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

16.10 The discharge rate of nozzle for fine cone spray pattern does not conform to the requirement of IS: 3652:1995. It MUST be looked into.

16.11 The nozzle is not marked. It MUST be marked.

16.12 The spray angle of nozzle at 300 KPa pressure does not conform to the requirement of IS: 3652:1995. It MUST be looked into.

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

16.14 The dimension of strap does not meet the requirement of Indian Standard. It MUST be looked into.
16.15 The aperture size of removable strainer on the filling cap does not meet the requirement of Indian Standard. It **MUST** be looked into.

16.16 Material of cushion does not meet the requirement of Indian Standard. It **MUST** be looked into.

16.17 The cut-off device is not marked. It should be marked.

16.18 The maximum trigger actuation torque does not conform to the requirement of IS: 3652:1995. It **MUST** be looked into.

16.19 The internal diameter of the spray lance does not meet the requirement of Indian Standard. It **MUST** be looked into.

16.20 The strap cushion thickness does not meet the requirement of Indian Standard. It **MUST** be looked into.

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

16.22 The area of strainer and strainer aperture size on cut off does not meet the requirement of Indian Standard. It **MUST** be looked into.

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

16.24 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