BATTERY OPERATED KNAPSACK SPRAYER
‘ASPEE, ADT 001/AHR’

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & COOPERATION)

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## BATTERY OPERATED KNAPSACK SPRAYER

### ASPEE, ADT 001/AHR', COMMERCIAL (ICT)

<table>
<thead>
<tr>
<th>XXIX</th>
<th>Material of construction of cut of device components</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Spindle, coupling nut &amp; gland nut</td>
<td>Brass, Engg. plastics</td>
</tr>
<tr>
<td>-Body, valve seat, gland nut, cap &amp; collar, Valve stem</td>
<td>Brass, Engineering plastic</td>
</tr>
<tr>
<td>-Nipple</td>
<td>Brass, Aluminium alloy, plastic</td>
</tr>
<tr>
<td>-Valve</td>
<td>Brass, synthetic rubber, plastic</td>
</tr>
<tr>
<td>-Strainer</td>
<td>Brass, Aluminium alloy, stainless steel, plastic</td>
</tr>
<tr>
<td>-Operating knob</td>
<td>Brass, Engineering plastic, plastic</td>
</tr>
<tr>
<td>-Operating trigger</td>
<td>Stainless steel, Engineering plastic</td>
</tr>
<tr>
<td>-Spring</td>
<td>Stainless steel, phosphor bronze</td>
</tr>
<tr>
<td>-Gasket</td>
<td>Synthetic rubber, fiber, leather, PVC</td>
</tr>
<tr>
<td>-Gland packing</td>
<td>Asbestos rope</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clause No.</th>
<th>Specified requirement</th>
<th>Observations</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cl. 4.3 IS 3906:1995</td>
<td>The material used for different components shall be declared by the manufacturer in the manual</td>
<td>Not declared in the manual as submitted by the manufacturer</td>
<td>Does not conform</td>
</tr>
</tbody>
</table>

### PERFORMANCE REQUIREMENTS (CI 5 IS 3906:1995)

| Cl. 5.1 Discharge rate | When tested in accordance with the method given in 6.1.3 of IS: 10134-1994 the pump shall be capable of discharging a minimum of 500 ml of water per minute | Pump is capable of discharging 2397.5 ml/min water. | Conforms |

| Cl. 5.2 Volumetric Efficiency | When tested in accordance with the method given in 6.2 of IS: 10134-1994, the volumetric efficiency shall be not less than 85 percent | Not applicable, as there is battery operated diaphragm pump. | -- |

### CONSTRUCTIONAL REQUIREMENTS (CL.6 IS 3906 :1995)

| Cl. 6.1 Tank | The tank capacity shall be 10,13 or 16 litres with a tolerance of ± 0.5 liter | The tank capacity is 16 liters | Conforms |
| Cl. 6.1.1 | The thickness of sheet used in manufacture of brass tank shall be minimum of 0.63 mm ± 0.03 mm | Not applicable, as the tank is made of plastic | Conforms |
### D-4.3.1
The inlet of the spray lance shall be attached to a Hydraulic pump directly or through a delivery hose. The outlet of the lance shall be closed that is no discharge shall be allowed from the lance. A hydraulic pressure of 1MPa or two and half time of the nominal working pressure of the sprayer (for which the lance is meant) which ever is more shall be applied to the lance up to a period of 5 minutes. During the test, the lance shall not leak, crack or burst.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Test Result</th>
<th>Conformity</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-5 MARKING</td>
<td>The lance shall be marked with the following particulars:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a)</td>
<td>Manufacturer’s name or recognized trademark,</td>
<td>Not marked</td>
<td>Does not conform</td>
</tr>
<tr>
<td>b)</td>
<td>Nominal length, and</td>
<td>Not marked</td>
<td>Does not conform</td>
</tr>
<tr>
<td>c)</td>
<td>Batch or code number.</td>
<td>Not marked</td>
<td>Does not conform</td>
</tr>
</tbody>
</table>

### 6.14 Nozzle
Unless otherwise specified by the purchaser, the nozzle shall conform to the requirement as given in Annexure-F of IS : 3652-1995.

### ANNEXURE F HYDRAULIC SPRAY NOZZLES (CL 6.8.4 OF IS 3652:1995)

<table>
<thead>
<tr>
<th>F-1 Types</th>
<th>On the basis of spray distribution the nozzles shall be of the following types:-</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-1.1</td>
<td>- a) Hollow cone type</td>
</tr>
<tr>
<td></td>
<td>- b) Fan type</td>
</tr>
<tr>
<td></td>
<td>- c) Adjustable type</td>
</tr>
<tr>
<td></td>
<td>- i) Double action type</td>
</tr>
<tr>
<td></td>
<td>- ii) Triple action type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F-1.2</th>
<th>On the basis of the method of attachment, the nozzles shall be of the following types:-</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Fixed type</td>
</tr>
<tr>
<td>b)</td>
<td>Swivel type</td>
</tr>
</tbody>
</table>

### F-3 PERFORMANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>F-3.1 Rate of discharge</th>
<th>The discharge rate of the nozzle shall be declared by the manufacturer. In case of adjustable nozzle, the declared value shall be for extreme adjustments for cone and jet spray patterns at a pressure of 300 kPa.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-3.1.1</td>
<td>Declared by the manufacturer</td>
</tr>
<tr>
<td>Requirement</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>F-3.1.2</td>
<td>When tested in accordance with F-7, the nozzles shall provide a rate of discharge as given in Table-3. The rate of discharge shall be within ±5 percent for fixed type and ±10 percent for adjustable type of nozzle, of the declared value.</td>
</tr>
<tr>
<td>F-3.2 Spray Angle</td>
<td>The spray angle of the nozzle shall be declared by the manufacturer. The angle, when tested in accordance with method given in F-9 shall not differ by ±3 deg, for fixed type and ±5 deg for adjustable type nozzles from the declared value.</td>
</tr>
<tr>
<td>F-3.3 Endurance test</td>
<td>The hydraulic spray nozzle when tested in accordance with F-7 and F-9 at a pressure of 300 ± 30 kPa after operating for 48 hour duration with continuous stretches of 6h, variation in discharge rate and spray angle from initial values should not be more than ±5 percent and ±3 deg, respectively.</td>
</tr>
<tr>
<td>F-4 Other Requirements</td>
<td>If strainer is provided, the average size of any side or diameter of the apertures shall be not more than 450μm.</td>
</tr>
<tr>
<td>F-4.2</td>
<td>At the option of the purchaser the provision shall be made for rotating the nozzle by hand to make it swivel type.</td>
</tr>
<tr>
<td>F-5 Designation</td>
<td>The cone and fan nozzle shall be designated by its identification mark, spray angle and discharge rate. An adjustable nozzle shall be designated by its identification mark AN-C-J for cone and Jet spray pattern and discharge rate at a controlled pressure of 300 kPa.</td>
</tr>
<tr>
<td>F-6 Workmanship &amp; Finish</td>
<td>The components of the spray nozzles shall be free from burrs and other defects, this applies particularly to the internal surfaces and specially to the orifice.</td>
</tr>
<tr>
<td>F-6.2</td>
<td>The mating faces of the cap, tip and nozzle body or boss, shall be finished flat so as to seal on the end face of the nozzle body or boss, a gasket may be used, if necessary.</td>
</tr>
<tr>
<td>F-6.3</td>
<td>The screw thread shall be well formed and the crests of the threads shall be free from burrs or any other defects which may prevent free engagement.</td>
</tr>
<tr>
<td>F-11 Marking</td>
<td>Each nozzle shall be marked with following particulars: a) Manufacturer's name &amp; recognized trade mark</td>
</tr>
</tbody>
</table>
5. COMMENTS & RECOMMENDATIONS:

5.1 The time required for full charging of battery was observed as 6 to 8 hr. the sprayer operation time after full charging was observed as 6 to 7½ hr.

5.2 Aspee ADT 001/AHR battery operated continues sprayer does not conforms the following requirements specified in Indian Standard. These should be rectified as per relevant Indian Standard.

   i) C1 4.3 IS: 3906-1995 – Declaration of material for different components in manual is not given.
   iii) C1 6.10 IS: 3906-1995- Discharge out let nipple length is on power side.
   iv) C 3.2. Area of strainer less than the minimum requirement.
   v) C1 6.13 Sub clause C-10 IS: 3906-1995- Cut-off device is not marked as per Indian Standard.
   vi) C1 6.8.3 Sub clause D-2 IS: 3652-1995 –Material of spray lance is not as per Indian Standard.
   vii) C1 6.8.3 Sub Clause D5 of IS: 3652-1995-The lance is not marked as per IS.
   viii) C1 6.8.4 Sub Clause F 3.2 IS: 3652-1995- Spray angle is not declared.
   ix) C1 6.8.4 Sub. Clause F 5(b) IS:3652-1995 Nozzle designation is not provided.
x) CI 6.8.4 Sub. Clause F (a), 11 (b) & (c) IS: 3652-1995- Nozzle marking is not provided.
xii) CI 9 IS: 3906-1995 – Serial not of sprayer is not specified on sprayer.
xii) CI 7.3.3 IS: 3906:1995- Agitator not provided.

5.3 Safety signs and hazard pictorials are not provided on machine. It should be provided.
5.4 Spray distribution pattern is complying in fig. 22 triangular distribution limit as per IS: 3652-1995.
5.5 The accessories for operator’s safety against pesticides are not provided. It should be provided for safety of operators.
5.6 The identifications of the sprayer viz make, model, serial number, manufacturer, trade name etc is not provided on the sprayer. Marking/labeling plate should be provided on sprayer.
5.7 Literature is provided with the machine during test. The operator’s manual, service manual and spare part catalogue should be brought out in Hindi and other regional languages for the consumer as per IS: 8732:1999.

TESTING AUTHORITY

<table>
<thead>
<tr>
<th>G.R. AMBALKAR</th>
<th>R.K. NEMA</th>
<th>HIMAT SINGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Engineer</td>
<td>Senior Agricultural Engineer</td>
<td>Director</td>
</tr>
</tbody>
</table>

Test report compiled by: Sh. Maan Singh, Sr. Technical Assistant

6. APPLICANT’S COMMENTS

<table>
<thead>
<tr>
<th>Para No.</th>
<th>Our Reference</th>
<th>Applicant’s Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>5.2 (ii)</td>
<td>We are using threading as per customer requirement.</td>
</tr>
<tr>
<td>6.2</td>
<td>5.2 (iii)</td>
<td>We will do the changes in our design.</td>
</tr>
<tr>
<td>6.3</td>
<td>5.2 (iv)</td>
<td>We will check at our end.</td>
</tr>
<tr>
<td>6.4</td>
<td>5.2 (v)</td>
<td>It was trial version, instead of it each cutoff.</td>
</tr>
<tr>
<td>6.5</td>
<td>5.2 (vii)</td>
<td>It was trial version, instead of it we mark each lance.</td>
</tr>
<tr>
<td>6.6</td>
<td>5.2 (viii)</td>
<td>It was trial version, instead of it we declare nozzle angle on each nozzle No.</td>
</tr>
<tr>
<td>6.7</td>
<td>5.2 (ix &amp; x)</td>
<td>It was trial version, instead of it we mark the discharge rate &amp; spray angle. Manufacturer’s name on nozzle.</td>
</tr>
<tr>
<td>6.8</td>
<td>5.2 (xi)</td>
<td>It was trial version, instead of it we mark the sprayer serial No. on each sprayer.</td>
</tr>
<tr>
<td>6.9</td>
<td>5.2 (xii)</td>
<td>It is not required in battery type sprayer.</td>
</tr>
</tbody>
</table>