BATTERY OPERATED KNAPSACK SPRAYER
VIJAY KRUSHI VKA-16C-28, RAINBOW

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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[ISO 9001:2015 CERTIFIED]

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VIJAY KRUSHI, VKA-16C-28, RAINBOW
BATTERY OPERATED KNAPSACK SPRAYER (COMMERCIAL)

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

1. Date of test : 16.02.2018
2. Atmospheric conditions :
   a) Temperature : 22 °C
   b) Relative humidity : 45%
   c) Pressure : 99.0 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>Speed of Pump (rpm)</th>
<th>Pressure (kg/cm²)</th>
<th>Test No.</th>
<th>Delivery from the discharge line (ml/min)</th>
<th>Overflow (ml/min)</th>
<th>Average discharge from the discharge line (ml/min)</th>
<th>Discharge rate of pump (ml/min)</th>
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<tbody>
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<td>4</td>
<td>1310</td>
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</tr>
</tbody>
</table>

Minimum discharge rate = 1315ml/min at 4 kg/cm²
Maximum discharge rate = 2097.5 ml/min at 1 kg/cm²
Discharge at rated pressure = 1472.5 ml/min at 3 kg/cm²

4. TEST FOR VOLUMETRIC EFFICIENCY
(Vide Clause 8.4 of IS – 11313: 2007)

Rated pressure, kg/cm² : 3
Avg. discharge of water at rated pressure, l/min : 1.475
Avg. discharge of water at no-load, l/min : 2.515
Avg. pump speed at no-load, rev/min : 3108
Avg. pump speed at rated pressure, rev/min : 2736
Volumetric efficiency of pump, % : 67

### 15. CONFORMITY TO INDIAN STANDARDS

**i)** IS: 11313:2007 Hydraulic power sprayers- specification  :  
<sup>Does not conform in toto</sup>

**ii)** IS: 10134-1994-Method of test for manually operated sprayer  :  
<sup>Does not conform in toto</sup>

**iii)** Spray nozzle and spray gun as per IS:3652-1995  :  
<sup>Does not conform in toto</sup>

(Reaffirmed 2011)

**iv)** 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 batch No/Serial No. of sprayer is not specified. It should be specified.

**16.2** Battery Serial No. is not specified. It should be specified.

**16.3** The Serial No. and speed of motor is not specified. It should be specified.

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

**16.5** Pump serial number and country of origin is not marked. It should be marked.

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

**16.7** The cut-off device and spray lance batch or code number is not marked. It should be marked.

**16.8** The volumetric efficiency of pump does not meet the requirement of Indian Standard. It MUST be improved.

**16.9** Agitator is not provided. It may be provided.
16.10 The strap cushion thickness does not meet the requirement of Indian Standard. It MUST be looked into.

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

16.12 The current drawn by motor at no load and on load was observed as 0.80A and 1.69 A respectively which does not conform to requirement of IS-14459: 1997.

16.13 Time required to full charge the battery with AC charger is observed as 8.02 to 8.03 hours.

16.14 The spraying operation time after fully charging the battery was observed as 7.8 to 7.9 hours.

16.15 During the pump chamber hydraulic test the motor stopped beyond 5.5 kg/cm² pressure against the pressure requirement of 7.5 kg/cm² and the test could not be conducted. This MUST be looked into and improved.

16.16 The nozzle designation does not meet the requirement of Indian Standard. It MUST be improved.

16.17 The discharge rate of nozzle for fine cone spray pattern does not meet the requirement of Indian Standard. It MUST be looked into.

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

16.19 The nozzle designation, Batch or Code No. is not marked. It MUST be marked.

16.20 During the strap drop test the buckle/bracket of strap assembly found failed to hold the strap in it’s position. It should be improved.

16.21 The material of pump inlet port end fitting does not meet the requirement of Indian Standard. It should be improved.

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

16.23 A suitable labeling 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