RSR RETAIL PVT. LTD. HY-910 N
BATTERY OPERATED KNAPSACK SPRAYER
(FITTED WITH SOLAR PANEL)

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 9001:2008 COMPLIANT INSTITUTION]

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

1. Date of test : 18.10.2016
2. Atmospheric conditions :
   a) Temperature : 32°C
   b) Relative humidity : 29%
   c) Pressure : 738.5 mm of Hg
3. Data recorded

<table>
<thead>
<tr>
<th>Working pressure kg/cm² (kPa)</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>
</tr>
</thead>
<tbody>
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<td>4</td>
<td>930</td>
<td></td>
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</table>

Minimum Discharge rate = 928 ml/min at 500 kPa
Maximum Discharge rate = 2444 ml/min at 50 kPa

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

As applicant has not specified the rated pressure and rated speed of pump, hence volumetric efficiency could not be ascertained, as per the requirement of relevant code.

However, volumetric efficiency, so to speak, was found to be 89.2 % & 35.8 % at 50kPa and at 500 kPa pressure respectively. Hence the Volumetric Efficiency was not found as much as required by the code, throughout the range of pressure.
### Choice of operation

The sprayer may be supplied with arrangement for operating lever to be fixed either on right or on left side.

### Each spray

Each spray shall be provided with a set of mask, hand gloves and safety goggles.

### Workmanship & Finish

The components of the sprayer shall have a smooth finish and shall be free from pits, burrs, sharp edges and other defects, that may be detrimental for their use.

### Metallic part

Metallic part are coated with enamel paint.

### Conformity to Indian Standards

- **i)** IS: 11313:2007 Hydraulic power sprayers- specification
  - Does not conform in toto
  - Does not conform in toto
- **ii)** IS: 10134-1994-Method of test for manually operated sprayer
  - Does not conform in toto
- **iii)** Spray nozzle and spray gun as per IS:3652-1995 (Reaffirmed 2011)
  - Does not conform in toto
- **vi)** IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation
  - Does not conform in toto

### Comments & Recommendations

16.1 The material of construction of component is not declared by the applicant. It should be declared.

16.2 The spray nozzle is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard, needs to be provided.

16.3 The sprayer batch number, serial number and year of manufacturer is not specified. It should be specified.
16.4 The sprayer working pressure is not specified. It should be specified.

16.5 Motor, serial number and speed is not specified. It should be specified.

16.6 Battery serial number is not specified. It should be specified.

16.7 The spray lance is not marked. It should be marked as per requirement of Indian Standard.

16.8 During the test for strap and its assembly, the buckle/bracket of strap assembly was found as failed to hold the strap in its position. The strap assembly should be improved.

16.9 Pump make, model, serial number, working pressure, rated pressure, rated speed and country of origin is not specified. It should be specified on sprayer.

16.10 Material of construction of sprayer component does not conform fully to the requirement of Indian Standard. It should be improved.

16.11 As applicant has not specified the rated pressure and rated speed of pump, hence volumetric efficiency could not be ascertained. As per the requirement of relevant code. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

16.12 As the applicant has not specified the specific speed for sprayer operation, the power requirement cannot be ascertained. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

16.13 As the discharge rate of nozzle at a pressure of 300 kPa was not declared by the applicant, the conformity of discharge to Cl F 3.1 of Annexure F of IS 3652-1995 could not be ascertained. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

16.14 As the spray angle of nozzle at a pressure of 300 kPa was not declared by the applicant, the conformity of discharge to Cl F 3.2 of Annexure F of IS 3652-1995 could not be ascertained. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

16.15 The cut off device and spray lance marked by providing sticker. Printed or engraved marking may be provided.

16.16 As applicant has not specified the rated pressure and rated speed of pump, hence volumetric efficiency could not be ascertained. As per the requirement of relevant code.

16.17 As the applicant has not specified the specific speed for sprayer operation, the power requirement cannot be ascertained.

16.18 As the discharge rate of nozzle at a pressure of 300 kPa was not declared by the applicant, the conformity of discharge to Cl F 3.1 of Annexure F of IS 3652-1995 could not be ascertained.
16.19 As the spray angle of nozzle at a pressure of 300 kPa was not declared by the applicant, the conformity of discharge to Cl F 3.2 of Annexure F of IS 3652-1995 could not be ascertained.

16.20 The cut of device is not provided with strainer. It may be provided.

16.21 Discharge outlet nipple length does not meet the requirements of Indian Standard. It should be looked into.

16.22 The maximum trigger actuation torque is 59.9 kgf-cm. This exceeds the limit specified by Indian Standard. It should be improved.

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

16.24 Agitator is not provided. It may be provided.

16.25 Battery charger make, model and country of origin is not specified by applicant. It should be specified on charger.

16.26 The strap cushion provided on sprayer does not meet the requirements of Indian Standard. It should be improved.

16.27 The time require for full charging of battery with the solar plate is observed as 12 to 14 hours. The voltage of fully charged battery charged with solar plate is observed as 12.12 to 12.44 V. The spraying operation time after fully charging was observed as 6 to 7 hours.

16.28 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 speed
   vi. Rated pressure
   vii. Discharge rate
   viii. Power rating
   ix. Country of origin

16.29 Safety provisions/safety wear
   i) The accessories viz mask, hand gloves and safety goggles for operator’s safety are provided with sprayer.
   ii) The safety instructions regarding handling of poisonous chemicals & first aid should be provided in operator’s manual.