MODERN MTI B-001
BATTERY 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/
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3. TEST FOR DISCHARGE RATE OF PUMP
(Vide Clause 8.3 of IS – 11313 : 2007)

1. Date of test : 11.07.2017
2. Atmospheric conditions:
   a) Temperature : 34 °C
   b) Relative humidity : 58 %
   c) Pressure : 97.3 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>Speed of Pump (rpm)</th>
<th>Working pressure (kg/cm²)</th>
<th>Test No.</th>
<th>Delivery from the discharge line (ml/min)</th>
<th>Overflow</th>
<th>Average discharge from the discharge line (ml/min)</th>
<th>Discharge rate of pump (ml/min)</th>
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</thead>
<tbody>
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<td>3050</td>
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</tr>
</tbody>
</table>

Minimum discharge rate = 1145.0 ml/min at 4 kg/cm²
Maximum discharge rate = 3050.0 ml/min at 1 kg/cm²
Discharge at rated pressure = 1780.0 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 : 1.775
Avg. discharge of water at no-load, l/min : 3.260
Avg. pump speed at no-load, rev/min : 3694
Avg. pump speed at rated pressure, rev/min : 3368
Volumetric efficiency of pump, % : 60

Cl. 8.2  | The exposed mild steel parts shall have a protective coating to prevent surface deterioration. The steel used for hose ferrule/clip shall be plated with cadmium, zinc or nickel exposed brass parts may be given a suitable protective finish with clear transparent lacquer. | Metallic parts are coated with enamel paint. | Conforms |

Cl. 9  | Each sprayer shall be marked with the following particulars |

|   | a) Manufacturer’s name or recognized trade mark |
|   | Modern Trading & Industries |
|   | Off: 483/8A, Sham Nagar, Near PRTC Workshop |
|   | Back Side Bus Stand, Ludhiana |
|   | Ph: 0161-2446482 |
|   | Factory: Lohara Road, Near Eastman Chowk, Dhandari Kalan-C, Ludhiana |
|   | Email: bsparmar296@gmail.com |

|   | b) Batch or Serial No. |
|   | Not marked |
|   | Does not conform |

|   | c) Tank nominal capacity |
|   | 18 ltr. |
|   | Conforms |

Cl.9.3  | Each sprayer shall be packed as agreed to between the purchase and the supplier for safe handling in transit. |

15. CONFORMITY TO INDIAN STANDARDS

i) IS: 11313:2007 Hydraulic power sprayers- specification  | 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  | Does not conform in toto |

(Reaffirmed 2011) |

iv) 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 should be marked.

16.2 Battery charger make, model and country of origin is not marked. It should be marked.

16.3 The make and speed of motor is not specified. It should be specified.

16.4 Pump make, model, serial number and country of origin is not marked. It should be marked.

16.5 The strainer in cut-off device and nozzle is not provided. It should be provided.

16.6 The cut-off device and spray lance batch or code number is not marked. It should be marked.
16.7 The material used for different components of sprayer is not declared. It should be declared.

16.8 The tank capacity of sprayer does not meet the requirement of Indian Standard. It MUST be looked into.

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

16.10 The maximum trigger actuation torque is 58.50 kgf-cm. This exceeds the limit specified by Indian Standard. It MUST be improved.

16.11 Agitator is not provided. It may be provided.

16.12 Metallic threaded connection provided on sprayer does not meet the requirements of Indian Standard. It MUST be looked into.

16.13 The strap width and strap cushion thickness does not meet the requirement of Indian Standard. It MUST be looked into.

16.14 The spray angle of nozzle does not meet the requirement of Indian Standard. It MUST be looked into.

16.15 The current drawn by motor at no load and on load was observes as 0.9 and 2.72 A respectively which does not conform to requirement of IS-14459: 1997.

16.16 Time required to full charge the battery with AC charger is observed as 10.33 to 11.10 hours.

16.17 The spraying operation time after fully charging the battery was observed as 8.08 to 9 hours.

16.18 During the pump chamber hydraulic test the motor stopped beyond 6.5 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.

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

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

16.21 The nozzle batch or code number is not marked. It MUST be marked.
16.22 The material of pump inlet port end lifting does not meet the requirement of Indian Standard. It should be looked into.

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

17. TECHNICAL LITERATURE

Operator, maintenance & parts manual of sprayer was provided during the test. However, the manual should be updated as per IS : 8132-1999, with the inclusion of safety instructions regarding handling of poisonous chemicals & first aid.

TESTING AUTHORITY

R. K. NEMA
SENIOR AGRICULTURAL ENGINEER

P. K. PANDEY
DIRECTOR

18. APPLICANT’S COMMENTS

Report is O.K.