COMMERCIAL TEST REPORT

HYMATIC H802
ENGINE 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

Website: http://nrfmtti.gov.in/
E-mail: fmti-nr@nic.in
Tele./FAX: 01662-276984
| Cl. 5.16.1 | The exhaust outlet of the engine shall be so positioned that the smoke does not directly affect the operator or crop. A guard shall be provided on or near the exhaust pipe for the protection of the operator. | The engine and exhaust is opposite to the operator and not expose to harmful exhaust, pipe is covered with guard. | Conforms |
| Cl. 5.17 | The fuel and chemical discharge controls shall be in easy access of the operator. | Easy accessible to the operator | Conforms |
| Cl. 5.18 | Air pressure chamber shall withstand the test prescribed in 8.7 with out any deformation or damage. | No damage found in air pressure chamber. | Conforms |

### PERFORMANCE REQUIREMENTS

**Cl. 6. IS 11313:2007**

| Cl.6.1 Discharge rate/Suction capacity | When tested in accordance with the method given in 8.3, the pump shall be capable of discharging/sucking a minimum of 8000 ml. water per minute at its rated speed and rated pressure. | The pump is capable to discharge 7248 ml/min at 12 kg/cm² pressure. | Does not conform |
| Cl.6.1.1 | The discharge rate/suction capacity shall be declared by the manufacturer. | 7 to 8 l/min declared in the technical specifications submitted by the manufacturer. | Conforms |
| Cl.6.2 Volumetric Efficiency Cl.6.2.1 | When determined in accordance with 8.4.1, the volumetric efficiency of the piston/plunger type pump shall minimum 80 percent. | The volumetric efficiency is 99.17% which is within specified limit. | Conforms |
| Cl.6.2.2 | The volumetric efficiency requirement for roller vane type pump shall be minimum 80%. | Not applicable | -- |
| Cl.6.3 Power requirement | When tested in accordance with the method given in 8.5, pump shaft power requirement shall not be more than that of the value declared by the manufacturer. | Not applicable | -- |
| Cl.6.4 Maximum achievable pressure | When tested in accordance with the method given in 8.7, maximum achievable pressure shall not be less than that of the value declared by the manufacturer. | Maximum achievable pressure observed as 12 kg/cm² against the declaration of 30 kg/cm². | Does not conform |
| Cl.6.5 Endurance test | Sprayer shall withstand the test endurance test specified in 8.8 and the variation in Discharge rate between first and last observation shall not be more than ± 5 Percent. | Endurance test of 50 hrs. completed without any breakdown & the variation in pressure. Percentage variation in discharge is 0.91% with in specified limit (see annexure IV for more details). | Conforms |
## WORKMANSHIP AND FINISH

**(Cl. 9 IS : 11313-2007)**

<table>
<thead>
<tr>
<th>Cl. 9.1</th>
<th>All the components of the sprayer shall be free from burrs, pits and other visual defects which may be detrimental for their use.</th>
<th>Finishing and workmanship is normal.</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cl. 9.2</td>
<td>The exposed metallic parts shall have a protective coating to prevent surface deterioration.</td>
<td>Exposed metallic parts have the protective coating.</td>
<td>Conforms</td>
</tr>
</tbody>
</table>

## MARKING AND PACKING

**(Cl. 10 IS:11313-2007)**

<table>
<thead>
<tr>
<th>Cl.10.1 Marking</th>
<th>Each sprayer shall be marked with the following particulars :-</th>
<th>Marked as Hymatic</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Manufacturer’s name &amp; his registered trade mark</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Sl. No. and batch or code No.</td>
<td>B-1/9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. **SUMMARY OF OBSERVATION**

5.1 The discharge rate was observed as 7248 ml/min at 12 kg/cm² pressure.

5.2 Volumetric efficiency was observed as 99.17% against the minimum requirement of 80%.

5.3 Power requirement: 0.7 kW as declared by the manufacturer. The engine provided on sprayer found having adequate power to spray.

5.4 Pressure adjustment: No fluctuation of the pressure was observed during the test.

5.5 Maximum achievable pressure was observed as 12 kg/cm².

5.6 **Endurance test**

   a) The test was conducted 50 hours. The discharge rate variation is observed as 0.91%, which is within the limit of ±5%.

   b) No noticeable breakdown was observed during the test.

6. **COMMENTS AND RECOMMENDATION**

6.1 **Conformity to Indian Standard**

Engine operated knapsack sprayer Hymatic-H802 conforms all the clauses of IS: 11313-2007 except requirement specified in the following clause. **These should be rectified and incorporated at manufacturing level:-**

   i) Cl. 5.9 IS: 11313-2007-Pump inlet/outlet port threaded length is not as per IS.
   ii) Cl. 5.11 IS: 11313-2007-Pressure gauge is not provided. It may be provided.
   iii) Cl. 5.12 IS: 11313-2007-Pressure dampener is not provided. It may be provided.
   iv) Cl. 6.1 IS: 11313-2007-Pump is not capable to discharge of minimum 8000 ml.
   v) Cl. 7.2 IS: 11313-2007-Strainer aperture size is not as per IS.
   vi) Cl. E.2.2 IS: 3652-1995-The diameter of connecting rod is not as per IS.
   vii) Cl.E.5 IS: 3652:1995- The spray gun is not designated by its identification mark.
   ix) The pump make, model & year of manufacturer is not specified by applicant. It should be specified.
   x) The pressure gauge & pressure dampener is not provided on sprayer. The pressure gauge should be essentially provided for guidance of user.
6.2 Safety provisions/safety wear
   i) The accessories viz mask, hand gloves and safety goggles for operator’s safety has not been provided with sprayer. These should be essentially provided for safety of user.
   ii) Safety signs and hazard pictorials are not provided on the machine. It must be provided on the machine for safety of user.
   iii) Safety instructions regarding handling poisonous agrochemical and first aid may also be added in operator’s manual for safety of user.

7. TECHNICAL LITERATURE
   The operation manual sprayer was provided during the test which found adequate whereas the literature should be undated with inclusion of calibration procedure, material of construction of parts and brought out as per IS: 8132:1999.

TESTING AUTHORITY

G. R. AMBALKAR
AGRICULTURAL ENGINEER

R. K. NEMA
SENIOR AGRICULTURAL ENGINEER

P. K. PANDEY
DIRECTOR

8. APPLICANT’S COMMENTS

<table>
<thead>
<tr>
<th>Para No.</th>
<th>Our Reference</th>
<th>Applicant’s Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1</td>
<td>6.1 (i) to (x)</td>
<td>We will take up the matter with principal manufacturer.</td>
</tr>
<tr>
<td>8.2</td>
<td>6.2</td>
<td>(i) We will provide safety kit for operator in future. (ii) In future, we will mention all the safety and hazard pictorials.</td>
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<tr>
<td>8.3</td>
<td>7</td>
<td>We will provide technical literature with material of construction in future.</td>
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