ICS FT-45
ENGINE OPERATED 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

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3. TEST FOR DISCHARGE RATE OF PUMP
[vide Clause 8.3 of IS: 11313: 2007]

1. Date of test : 23.01.2017
2. Atmospheric conditions :
a) Temperature : 20°C  
  b) Relative humidity : 40% 
  c) Pressure : 99 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>Specified 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>
<th>Power consumed by pump (kW)</th>
</tr>
</thead>
<tbody>
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<td>12100</td>
<td>27980</td>
<td>12160</td>
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</tbody>
</table>

Minimum discharge rate = 39117.5 ml/min at 25 kg/cm²
Maximum discharge rate = 40140 ml/min at 15 kg/cm²
Discharge at rated pressure = 40140 ml/min at 15 kg/cm²

4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP
[vide clause 8.4 of IS: 11313-2007]

<table>
<thead>
<tr>
<th>Rated pressure, kg/cm²</th>
<th>Rated rpm of pump</th>
<th>Theoretical volume, ml</th>
<th>Actual volume at rated rpm and pressure, ml</th>
<th>Volumetric efficiency, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>850</td>
<td>48.67</td>
<td>47.15</td>
<td>96.9</td>
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</tbody>
</table>
16. COMMENTS AND RECOMMENDATIONS

16.1 Sprayer serial number is not specified. It should be specified.

16.2 Pump manufacturing year and country of origin is not specified. It should be specified.

16.3 The pressure gauge marking exceeds 2.5 times the declared value of pressure. Suitable pressure gauge MUST be provided to ensure the compliance of the relevant Indian Standard.

16.4 Through pressure regulator cum relief valve it was possible to increase pressure up to 44 kg/cm², which is more than 25% of the maximum pressure declared by applicant. It MUST be looked into.

16.5 The thickness of the wall of the barrel is less than the value specified in the relevant Indian Standard. It MUST be improved.

16.6 The spray nozzle and spray gun is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard, MUST be provided.

16.7 The discharge rate for fine cone spray & jet spray pattern of spray gun at the pressure of 600 ± 60 kPa does not conform to the requirement of IS: 3652-1995. It MUST be looked into.

16.8 The discharge rate for jet spray pattern at a pressure of 300 kPa was not as per Indian Standard. It MUST be looked into.

16.9 The spray angle for fine cone spray pattern at a pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It MUST be looked into.

16.10 The guard is not provided on or rear the exhaust pipe. It MUST be provided for the protection of user.

16.11 Maximum permissible wear limit of engine piston diameter is not specified by the applicant. It MUST be specified.

16.12 Maximum permissible wear limit of engine main bearing diametrical clearance & crankshaft end float is not specified by the applicant. It MUST be specified.

16.13 Maximum permissible wear limit of engine valve guide clearance is not specified by the applicant. It MUST be specified.
16.14 Maximum power declared by applicant is 4.0 kW and power displayed on labeling plate of engine and BIS report provided by the applicant is 3.6 kW. It should be looked into for corrective action.

16.15 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 of engine
  ix. SFC of engine

17. TECHNICAL LITERATURE

The following literatures are provided with sprayer for guidance to the users.

   (i) Maintenance manual and spare parts list
   (ii) Power sprayer operating manual

The literature was found inadequate as all the necessary information required was not there. It needs to be updated as per IS: 8132-1999, with the inclusion of safety instructions regarding handling poisonous agro-chemicals, safety precautions before, during and after spraying.

TESTING AUTHORITY

R. K. NEMA
SENIOR AGRICULTURAL ENGINEER

P. K. PANDEY
DIRECTOR

18. APPLICANT'S COMMENTS

We have noticed comments and recommendations under Para 16.1 to 16.14 which is not conform. With immediate effect we will inform to the production unit to take care the corrective action and in future supply above points will be considered before dispatch from factory to the sales unit.