ENGINE OPERATED PORTABLE SPRAYER
SHAKTI SPS-P768H

Government of India
Ministry of Agriculture and Farmers Welfare
Department of Agriculture, Cooperation and Farmers Welfare
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3. TEST FOR DISCHARGE RATE OF PUMP
[vide Clause 8.3 of IS-11313: 2007]

1. Date of test: 12.05.2017
2. Atmospheric conditions:
   a) Temperature: 39.4 °C
   b) Relative humidity: 44 %
   c) Pressure: 97.3 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>Specified speed of engine (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 delivery 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>
<tr>
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<td></td>
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<td>8100</td>
<td></td>
<td>8082.5</td>
<td></td>
<td>0.17</td>
</tr>
<tr>
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<td></td>
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<td>8100</td>
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<td>4100</td>
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<td>4075.0</td>
<td></td>
<td>0.17</td>
</tr>
</tbody>
</table>

Minimum discharge rate = 4075 ml/min at 25 kg/cm²
Maximum discharge rate = 8082.5 ml/min at 13 kg/cm²
Discharge at rated pressure = 7690 ml/min at 15 kg/cm²

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

Rated pressure, kg/cm²: 15
Pump speed corresponding to rated speed of engine: 1900
Theoretical volume, ml: 4.08
Actual volume at rated speed and pressure, ml: 4.04
Volumetric efficiency, %: 99
## 15. CONFORMITY TO INDIAN STANDARDS

<table>
<thead>
<tr>
<th>i)</th>
<th>IS:11313-2007  (Reaffirmed 2012)-Hydraulic power sprayer-specification : Does not conform in toto</th>
</tr>
</thead>
<tbody>
<tr>
<td>ii)</td>
<td>Spray nozzle and spray gun as per IS:3652-1995 (Reaffirmed 2011) : Does not conform in toto</td>
</tr>
<tr>
<td>iii)</td>
<td>Hose and hose connection as per IS:10134-1994 : Conforms</td>
</tr>
<tr>
<td>iv)</td>
<td>IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation : Conforms</td>
</tr>
<tr>
<td>v)</td>
<td>IS: 7347-1974 (Reaffirmed 2006)-Specification for performance of small size spark ignition engines for agricultural water pumps, sprayers, tillers, reapers and other similar applications : Could not be ascertained</td>
</tr>
</tbody>
</table>

## 16. COMMENTS AND RECOMMENDATIONS

16.1 The sprayer serial number and year of manufacture is not specified. It MUST be specified.

16.2 Compression ratio of engine is not specified. It should be specified.

16.3 Make & model, manufacturing year, serial number and country of origin of pump is not specified, which obscures the identity of pump and therefore not acceptable. It MUST be looked into.

16.4 The discharge rate of spray gun for fine cone spray pattern at 600±60 kPa is not within the limit. It MUST be improved.

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

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

16.7 The length of spray gun is less than the value specified in the relevant Indian Standard. It MUST be improved.

16.8 The discharge rate for fine cone spray pattern at a pressure of 300 kPa does not conform to the requirement of IS: 3652:1995.

16.9 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.

16.10 The diameter of connecting rod is less than the value specified in the relevant Indian Standard. It MUST be improved.

16.11 The discharge rate of sprayer at the rated pressure and rated speed does not conform to the requirement of IS: 11313:2007. It needs to be improved.
16.12 Through the regulator cum relief valve it is possible to increase pressure up to 36 kg/cm², which is more than 25% of the maximum pressure declared by the applicant. It MUST be looked into.

16.13 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

Though an specification sheet of engine and sprayer was provided, the same was, however, found inadequate, as all 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-chemical and first aid.

TESTING AUTHORITY

R. K. NEMA
SENIOR AGRICULTURAL ENGINEER

P. K. PANDEY
DIRECTOR

18. APPLICANT'S COMMENTS

We will follow the comments and recommendations mentioned at para 16.1 to 16.14 of the report.