VISWAS-708 HYDRAULIC KNAPSACK POWER SPRAYER

Government of India
Ministry of Agriculture and Farmers Welfare
Department of Agriculture, Cooperation and Farmers Welfare
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| Cl. 5.16 | The engine and electric motor shall conform to the requirements as given IS:7347-1974 (Reaffirmed 2006) and IS:325-1996 (Reaffirmed 2007) respectively. | The prime mover fitted in the sprayer is having make & model TU-26 petrol engine of 0.7 kW at rated speed of 6000 rpm, the engine performance test has not been conducted and the performance parameters as specified by the applicant have been presumed. | -- |
| 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 exhaust is opposite to the operator and the operator is not exposed to harmful exhaust. Pipe is covered with cage cover. | 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 with stand 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 6530 ml/min without gun at 6019 rpm of engine speed and 12 kg/cm² pressure. | Does not conform |
| Cl.6.1.1 | The discharge rate/suction capacity shall be declared by the manufacturer. | 7.1 l/min declared in the manual of 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 98.3 % 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 20 kg/cm² with gun against the declaration of 10 to 40 kg/cm².  
Conforms

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 1.16% with in specified limit (see annexure IV for more details).  
Conforms

Cl. 7 OTHER REQUIREMENTS  
(IS 11313:2007)

Cl. 7.1 Each sprayer shall be provided with parts catalogue and manual giving detailed information about sprayer, engine, its rated speed along with operational and maintenance instructions and safety precautions.  
Manual and parts catalogue is provided by the manufacturer and found adequate in contents.  
Conforms

Cl. 7.2 Each sprayer shall be provided with a set of necessary tools, suction strainer having aperture size of 300 µm to 425 µm and a measuring jar for lubricating oil.  
One set of tools kit, gaskets and measuring jar is provided with sprayer.  
Conforms

Cl. 7.3 On the option of the purchaser, the following accessories shall be supplied  

a) A set of spray nozzles conforming to Annexure-F of IS:3652-1995 (Reaffirmed 2006) for different discharge rates, and  
Not applicable

b) Spray gun conforming to Annexure-E of IS:3652-1995 (Reaffirmed 2006)  
Provided  
Conforms

Cl. E 1 Types IS:3652:1995  
The spray guns shall be of the following two types:  

a) Trigger type  
b) Screw type  
N.A  
Screw type  
Conforms

Cl. E 2 Dimensions  

Cl. E 2.1 The thickness of the wall of the barrel shall be minimum of 0.63 mm.  
0.54 mm  
Does not conform

Cl. E 2.2 The diameter of the connecting rod shall be minimum of 5 mm.  
5.02 mm  
Conforms

Cl. E 2.3 The annular clearance between the barrel and the connecting rod shaft be not less than 2.5 mm.  
The annular clearance between the barrel and the connecting rod is 3.25 mm.  
Conforms
### OTHER REQUIREMENT (Cl. E4)

<table>
<thead>
<tr>
<th>Cl. E 4.1</th>
<th>The farthest point of the trigger in case of the trigger type shall be at a distance not exceeding 100mm (to facilitate convenience grip by hand) when the value is in closed position when the trigger is pressed for full discharge it shall have a minimum clearance of 10 mm from the barrel tube.</th>
<th>Not applicable as trigger type cut off device is not provided</th>
<th>--</th>
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<tr>
<td>Cl. E 4.2</td>
<td>A lock for locking the trigger in different positions to attain different spray patterns shall be provided.</td>
<td>Not applicable</td>
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<td>Cl. E 4.3</td>
<td>The total mass of the spray gun having a length upto 1000 mm shall not exceed 1.6 kg.</td>
<td>Total mass of the gun provided is 0.420 kg</td>
<td>Conforms</td>
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<tr>
<td>Cl. E 5 Designation Cl. E 5.1</td>
<td>The gun shall be designated by its identification mark AG-C-J for fine cone spray and jet spray pattern, spray angle and discharge at a nominal pressure of 600 kPa.</td>
<td>Not marked</td>
<td>Does not conform</td>
</tr>
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| Cl. E 6 Marking | Each gun shall be marked with the following particulars  
   a) Manufacturer’s name or recognized trade mark, and  
   b) Batch or code no. | Not Marked | Does not conform |

### WORKMANSHIP AND FINISH (Cl.9 IS : 11313-2007)

<table>
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<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 good.</th>
<th>Conforms</th>
</tr>
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<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>
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### MARKING AND PACKING (Cl.10 IS:11313-2007)

| Cl.10.1 Marking | Each sprayer shall be marked with the following particulars :-  
   a) Manufacturer’s name & his registered trade mark  
   b) Sl. No. and batch or code No. | Marked Viswas-708 | Conforms |
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<tbody>
<tr>
<td>a) Manufacturer’s name &amp; his registered trade mark</td>
<td>Marked Viswas-708</td>
<td>Conforms</td>
<td></td>
</tr>
<tr>
<td>b) Sl. No. and batch or code No.</td>
<td>Not marked</td>
<td>Does not conform</td>
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### SUMMARY OF OBSERVATION

5.1 The discharge rate was observed as 6530 ml/min at 12 kg/cm².

5.2 Volumetric efficiency was observed as 98.3% against the minimum requirement of 80%.

5.3 Power requirement: 0.7 kW as declared by the applicant. The engine provided on sprayer found having adequate power to spray.
5.5 Endurance test
a) The test was conducted 50 hours the discharge rate variation is observed as 1.16% which in within the limit of ±5%.
b) No breakdown was observed during the endurance test.

6. COMMENTS AND RECOMMENDATION

6.1 Conformity to Indian Standard
Hydraulic knapsack power sprayer Viswas-708 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) The prime mover fitted in the sprayer is having make & model TU-26 petrol engine of 0.7 kW at rated speed of 6000 rpm. In pursuance of Ministry’s order No. 7-23/2011-M&T (I&P) dated 20.04.2011 the engine performance test as per IS:7347-1974 has not been conducted and the performance parameters as specified by the applicant have been presumed.

ii) Cl. 6.1 IS: 11313:2007-Discharge rate/suction capacity of sprayer pump is not conform, it should be looked into.

iii) Cl. E 2.1 IS: 3652-1995-The thickness of barrel wall of gun is not as per Indian Standard.

iv) Cl. E.5 IS: 3652:1995- The spray gun is not designated by its identification mark, it should designated.

v) The gun does not conform the requirement of IS: 3652:1995 Clause E-6 (a) & (b). The manufacturer name or recognized trade mark and Batch No. or Code No. Should be on marked gun.

vi) Cl. 10.1 IS: 11313-2007-Sr. No. and Batch or Code No. of sprayer is not provided. It should be provided.

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. It should be 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.