COMMERCIAL TEST REPORT

THIS TEST REPORT VALID UP TO : 31st July, 2026

SRI MARUTHI, FM 80-W
TRACTOR OPERATED BOOM 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
[ISO 9001:2015 CERTIFIED]

Website: http://nrfmtti.gov.in/
Tele./FAX: 01662-276984

E-mail: fmti-nr@nic.in
3. TEST FOR DISCHARGE RATE OF PUMP
[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 11.05.2019
2. Atmospheric conditions :
   a) Temperature : 37°C
   b) Relative humidity : 28%
   c) Pressure : 98.4 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>
<th>Hydraulic power (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>819</td>
<td>15</td>
<td>1</td>
<td>61500</td>
<td>Nil</td>
<td>61800.0</td>
<td>61800.0</td>
<td>3.60</td>
</tr>
<tr>
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<td>2</td>
<td>61570</td>
<td></td>
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<tr>
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<td>61650</td>
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</tr>
<tr>
<td>801</td>
<td>20</td>
<td>1</td>
<td>59860</td>
<td>Nil</td>
<td>60177.5</td>
<td>60177.5</td>
<td>4.16</td>
</tr>
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<tr>
<td>780</td>
<td>25</td>
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<td>58500</td>
<td>Nil</td>
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<td>58712.5</td>
<td>4.51</td>
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<td></td>
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<td>2</td>
<td>58670</td>
<td></td>
<td></td>
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</tr>
<tr>
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<td></td>
<td>3</td>
<td>58460</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>59220</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>766</td>
<td>30</td>
<td>1</td>
<td>57530</td>
<td>Nil</td>
<td>57725.0</td>
<td>57725.0</td>
<td>4.73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>57750</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>3</td>
<td>57520</td>
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<td></td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td>4</td>
<td>58100</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Minimum discharge rate = 57725.0 ml/min at 30 kg/cm²
Maximum discharge rate = 61800.0 ml/min at 15 kg/cm²
Discharge at Rated pressure = 60177.5 ml/min at 20 kg/cm²

4 TEST FOR VOLUMETRIC EFFICIENCY OF PUMP
(Vide clause 8.4 of IS-11313 : 2007)

Rated pressure, kg/cm² : 20
Rated rpm of pump : 801
Theoretical Volume, ml : 82.03
Actual volume at rated rpm & rated pressure, ml : 75.13
Volumetric efficiency % : 92
5. POWER REQUIREMENT
(Vide Clause 6.3 of IS – 11313 : 2007)

The pump power requirement of the sprayer has been given as 5 to 7.5 hp (3.68 to 5.52 kW).

The test for power required for operating the sprayer was conducted as per clause 8.5 of IS: 11313-2007 and data recorded is reported herewith.

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Pressure (kg/cm²)</th>
<th>Dynamometer reading</th>
<th>Pump speed (rpm)</th>
<th>Required power (kW)</th>
<th>Discharge (liter/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Speed (rpm)</td>
<td>Torque (Nm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>15</td>
<td>392</td>
<td>86.7</td>
<td>819</td>
<td>3.60</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>386</td>
<td>102.0</td>
<td>801</td>
<td>4.16</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>380</td>
<td>112.0</td>
<td>780</td>
<td>4.51</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>372</td>
<td>120.0</td>
<td>766</td>
<td>4.73</td>
</tr>
</tbody>
</table>

Remark:

i) The power requirement was observed from 3.60 to 4.73 kW throughout the range of pressure against the declaration of 5 to 7.5hp (3.68 to 5.52 kW)

ii) At rated speed and pressure of pump the power requirement is observed as 4.16 kW.

6. PRESSURE ADJUSTMENT TEST
(Vide Clause 8.7.1 of IS: 11313-2007)

1. Date of test : 11.05.2019
2. Atmospheric conditions :
   a. Temperature : 37 °C
   b. Relative humidity : 28%
   c. Pressure : 98.4 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Working pressure(kg/cm²)</th>
<th>Fluctuation range (kg/cm²)</th>
<th>Pressure drop (kg/cm²)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>15</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>2.</td>
<td>20</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>3.</td>
<td>25</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>4.</td>
<td>30</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
</tbody>
</table>

4. Resistance of pressure: Yes

7. TEST FOR HYDRAULIC SPRAY GUN
[Vide Clause 7.3(b) of IS- 11313: 2007 & Annex E of IS- 3652; 1995]

Date of test : 02.05.2019
Type of gun : Screw type

7.1 TEST FOR DISCHARGE RATE OF SPRAY GUN

The discharge rate for fine cone spray & jet spray pattern as 3000 ml/min & 4000 ml/min at the pressure of 600 kPa was declared by the applicant. The discharge rate corresponding to 600 kPa pressure was observed as under

-For fine cone spray pattern : 4210.0 ml/min
-For jet spray pattern : 8987.5 ml/min

NORTHERN REGION FARM MACHINERY TRAINING AND TESTING INSTITUTE, HISAR
[THIS REPORT VALID UP TO : 31ST JULY 2026]
<table>
<thead>
<tr>
<th></th>
<th>Item Description</th>
<th>Requirement</th>
<th>Provided</th>
<th>Conformity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>P.T.O. drive shaft -Safety against overload</td>
<td>Must be provided</td>
<td>Not provided</td>
<td>Does not Conform</td>
</tr>
<tr>
<td></td>
<td>-Guard on shaft</td>
<td>Must be provided</td>
<td>Not provided</td>
<td>Does not Conform</td>
</tr>
<tr>
<td>11</td>
<td>Guard on belt pulley drive</td>
<td>Must be provided</td>
<td>Not provided</td>
<td>Does not Conform</td>
</tr>
<tr>
<td>12</td>
<td>Safety wear</td>
<td>Mask, hand gloves, gum boots and goggles, aprons must be provided</td>
<td>Mask, Hand gloves and goggles provided</td>
<td>Does not Conform in toto</td>
</tr>
<tr>
<td>13</td>
<td>Labeling plate sprayer</td>
<td>Metallic labeling plate should be riveted with following information manufactures name, make, model, serial number, month, &amp; year of manufacture, rated speed, rated pressure and recommended tractors horse power</td>
<td>Just sticker on mainframe with following information SRI MARUTHI AGRO INDUSTRY, 21/910-2, RAMIREDDY PALLE ROAD, JAMMALAMADUGU-516464, YSR KADAPA DIST-A.P. CELL:-9985831850, 9441932027, FM 80-W</td>
<td>Does not Conform in toto</td>
</tr>
<tr>
<td>14</td>
<td>Literature</td>
<td>Operator manual, service manual &amp; parts catalogue should be provided</td>
<td>Operated manual with parts catalogue is provided</td>
<td>Does not Conform</td>
</tr>
</tbody>
</table>

15. CONFORMITY TO INDIAN STANDARDS

i) IS:11313-2007 (Reaffirmed 2012)-Hydraulic power sprayer-specification: Does not conform in toto

ii) Spray nozzle and spray gun as per IS:3652-1995 (Reaffirmed 2011): Does not conform in toto

iii) Hose and hose connection as per IS:10134-1994: Conforms

iv) IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation: Conforms

v) Three point linkage hitch as per IS: 4468 (Part:1): 1997(Reaffirmed 2012): Does not conform in toto


16. COMMENTS AND RECOMMENDATIONS

16.1 The serial No. and year of manufacturer of sprayer is not marked. It MUST be looked into.

16.2 The serial No. and year of manufacturer of pump is not marked. It MUST be looked into.
16.3 The three point linkage and power input connection dimensions does not meet the requirement of Indian Standard. It MUST be improved.

16.4 The material pump cylinder does not meet the requirement of relevant code/standards. It MUST be looked into.

16.5 The discharge rate for fine cone spray pattern and jet spray pattern spray gun at the pressure of 600 kPa does not conform the requirement of IS: 3652: 1995. It MUST be looked into for appropriate improvement.

16.6 The spray angle for fine cone spray pattern of gun at a pressure of 600 kPa does not conform to the requirement of IS: 3652-1995. It MUST be looked into.

16.7 The spray gun provided with sprayer is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard needs to be provided.

16.8 The manufacturer's name or recognized trade mark and batch or code number is not marked on spray gun. It MUST be marked.

16.9 A suitable pressure gauge/pressure indicator needs to be provided on sprayer as per the specifications specified by Indian Standard.

16.10 The discharge rate for fine cone spray pattern and jet spray pattern of nozzle at the pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It MUST be looked into.

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

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

16.13 The nozzle batch or code number is not marked on nozzle. It MUST be looked into.

16.14 Suction strainer aperture size does not meeting requirement of relevant code/standard. It MUST be looked in to.

16.15 Provision against on P.T.O. drive shaft is not provided. It MUST be looked in to.

16.16 Safety guard on drive shaft is not provided. It MUST be looked in to.

16.17 The power input connection yoke bore dimensions does not meet the requirement of Indian standard. It MUST be improved.

16.18 The length of spray gun does not meet the requirement of relevant code/standard. It MUST be looked in to.

16.19 The guard on belt pulley drive is not provided. It MUST be provided.

16.20 The material of pressure regulator does not meet the requirement of relevant code/standard. It MUST be looked into.

16.21 The material of connecting rod does not meet the requirement of relevant code/standard. It MUST be looked into.
16.22 A suitable labeling plate 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. Recommended tractor horse power

16.23 Safety provision/safety wear
   i) Gum boots & apron MUST be added on safety wear.
   ii) Safety instructions before, during and after spraying operation must be provided on sprayer.

17. TECHNICAL LITERATURE
   The following literatures are provided with sprayer for guidance to the user.
   1. Operator's manual of sprayer with parts catalogue.
   The following literature MUST be provided with the spray
   The operators manual of sprayer needs to be updated as per IS: 8132-1999.

TESTING AUTHORITY

<table>
<thead>
<tr>
<th>R.K. NEMA</th>
<th>SENIOR AGRICULTURAL ENGINEER</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. K.PANDEY</td>
<td>DIRECTOR</td>
</tr>
</tbody>
</table>

18. APPLICANT'S COMMENTS
   We will take corrective action at production level as per Indian Standard.