BALAJI DİMOND-530,
TRACTOR 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
[ISO 9001:2015 CERTIFIED]

Website: http://nrfmtti.gov.in/

E-mail: fmti-nr@nic.in

Tele./FAX: 01662-276984
| x) | Suction strainer | Brass, stainless steel, plastics | Stainless steel | Conforms |
x| xi) | Strainer body | Brass, plastics | Plastic | Conforms |
x| xii) | Gasket | Rubber, PVC, Leather, fiber | PVC | Conforms |
x| xiii) | Spray nozzles | Brass, stainless steel | Brass | Conforms |
x| xiv) | Spray boom | Mild steel, Galvanized, iron Braided rubber | N.A. | -- |
x| xv) | Hose | Synthetic rubber, P.V.C | PVC | Conforms |
x| xvi) | Tank | Galvanized iron, Brass, Fiber glass reinforced plastics. | Plastics | Conforms |
x| xvii) | Pipe for agitator | Galvanized iron, Brass, PVC | PVC | Conforms |
x| xviii) | Piston (bucket) screw | Brass, stainless steel | NA | -- |
x| xix) | Crank case | Aluminum alloy | Aluminum alloy | Conforms |
xx) | Roller pump body | Nickel resistant cast iron | N.A. | -- |
xxi) | Roller pump and plate | Nickel resistant cast iron | N.A. | -- |
xxii) | Roller pump rotor | Nickel resistant cast iron | N.A. | -- |
xxiii) | Piston pump crank shaft | Carbon steel | Carbon steel | Conforms |
xxiv) | Pump inlet port end fitting | Brass | Cast iron | Does not conform |
xxv) | Piston rod guide | Brass, Aluminum alloy, Gunmetal, Nylon | N.A. | -- |
xxvi) | Connecting rod | Carbon steel | Carbon steel | Conforms |
xxvii) | Gudgeon pin | Carbon steel | Carbon steel | Conforms |
xxviii) | Big end bearing | Steel coated with tin base white metal | Steel coated with tin base white metal | Conforms |
xxix) | Small end bush | Gunmetal | Gunmetal | Conforms |
xxx) | The material used for different components shall be declared by the manufacturer all the components mentioned in the table-I may not be present in a particular sprayer. | | | |

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

1. Date of test : 13.02.2019
2. Atmospheric conditions :
   a) Temperature : 23°C
   b) Relative humidity : 58%
   c) Pressure : 99.1 kPa
3. Data recorded

NORTHERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE, HISAR
[THIS REPORT VALID UP TO : 31st March 2026]
<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 (ml/min)</th>
<th>Average discharge from the discharge line (ml/min)</th>
<th>Discharge rate of pump (ml/min)</th>
<th>Hydraulic power (Kw)</th>
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</thead>
<tbody>
<tr>
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<td>20</td>
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<td>32180</td>
<td>Nil</td>
<td>32200</td>
<td>32200</td>
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<td>797</td>
<td>25</td>
<td>1</td>
<td>32000</td>
<td>Nil</td>
<td>31937.5</td>
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<td>1.58</td>
</tr>
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<tr>
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</table>

Minimum discharge rate = 30795 ml/min at 35 kg/cm²
Maximum discharge rate = 32200 ml/min at 20 kg/cm²
Discharge at Rated pressure = 32200 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 : 802
Theoretical Volume, ml : 41.48
Actual volume at rated rpm & rated pressure, ml : 40.15
Volumetric efficiency % : 97%

5. POWER REQUIREMENT
(Vide Clause 6.3 of IS – 11313 : 2007)
The pump power requirement of the sprayer has been given as 3 hp (2.24 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.
### BALAJI DIMOND-530,
TRACTOR OPERATED SPRAYER (COMMERCIAL)

<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 (litre/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>20</td>
<td>393</td>
<td>27.0</td>
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</tr>
<tr>
<td>2</td>
<td>25</td>
<td>388</td>
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<td>797</td>
<td>1.58</td>
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<td>30</td>
<td>383</td>
<td>47.2</td>
<td>787</td>
<td>1.91</td>
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<tr>
<td>4</td>
<td>35</td>
<td>381</td>
<td>53.5</td>
<td>775</td>
<td>2.15</td>
</tr>
</tbody>
</table>

**Remark:**

i) The power requirement was observed from 1.12 to 2.15 kW throughout the range of pressure against the declaration of 3 hp (2.24 kW)

ii) At rated speed and pressure of pump the power requirement is observed as 1.12 kW.

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

1. Date of test : 13.02.2019
2. Atmospheric conditions :
   a. Temperature : 23 °C
   b. Relative humidity : 58%
   c. Pressure : 99.1 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>20</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>2.</td>
<td>25</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>3.</td>
<td>30</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>4.</td>
<td>35</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 : 13.02.2019
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 4000 ml/min & 5000 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 : 5145 ml/min
- For jet spray pattern : 6600 ml/min

Remarks : Discharge Rate for fine cone spray pattern and jet spray pattern was observed not within the limit specified by the relevant code/standard.
Cl. 9

Cl. 9.1 All the components of the sprayer shall be free from burrs, pits and other visual defects which may be detrimental for their use. Nothing that may be detrimental for use was noticed Conforms

Cl. 9.2 The exposed metallic parts shall have a protective coating to prevent surface deterioration. Exposed metallic parts have the protective coating. Conforms

Cl. 10. 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 and his registered trade mark, Sl. No. and batch or code No. SRI BALAJI AGRO INDUSTRY S.N. 285 & 286, HANUMAN GUTHI ROAD, YERRAGUNTALA YSR KADAP DISTT. ANDHRA PARDESH MOB. 9849963548. Does not conform in spirit and also in toto

14. 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

vi) Dimensions of PIC yoke as per IS: 4931:1995 (Reaffirmed 2009) Does not conform in toto

15. COMMENTS AND RECOMMENDATIONS

15.1 The serial No. of sprayer ,year of manufacture and recommended Tractor Power is not specified. It MUST be specified.

15.2 The year of manufacture of pump and Serial No is not specified. It should be specified.

15.3 The material of pump cylinder, pressure regulator and pump inlet port end fitting does not meet the requirement of Indian Standard. It MUST be looked into.

15.4 The three point linkage and power input connection dimensions does not meet the requirement of Indian Standard. It MUST be improved.

15.5 The discharge rate for fine cone spray pattern and jet spray pattern of gun at the pressure of 600 kPa does not conform to the requirement of IS: 3652: 1955. It MUST be looked into for appropriate improvement.
15.6 Provision against overload on P.T.O. drive shaft is not provided, It MUST be looked into.
15.7 Safety guard on P.T.O. drive shaft is not provided. It MUST be looked into.
15.8 Maximum achievable pressure does not meet the requirement of relevant Indian Standard. It MUST be looked into.
15.9 The spray gun provided with sprayer is not designated as specified by relevant Indian Standard. It should be designated.
15.10 A suitable drain plug should be provided at the bottom of the tank for cleaning.
15.11 A suitable pressure gauge/pressure indicator needs to be provided on sprayer as per the specifications specified by Indian Standard.
15.12 The discharge rate for fine cone spray and jet 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.
15.13 The spray nozzle is not designated as specified by relevant Indian Standard, needs to be provided.
15.14 The spray angle for fine cone 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 for further improvement.
15.15 Necessary tools are not provided with sprayer. It MUST be provided.
15.16 The engaged threaded length of outlet port does not meet the requirement of relevant Indian Standard. It MUST be looked into.
15.17 The aperture size of suction strainer does not meet the requirement of relevant Indian Standard. It MUST be looked into.
15.18 As an important thing as pressure regulator was found “not working”. It MUST be looked into.
15.19 The spray angle for fine cone spray pattern of spray nozzle at the pressure of 300±30 kPa does not conform to the requirement of IS : 3652-1995. It MUST be looked for further improvement.
15.20 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
15.21 Safety provision/safety wear

i) Safety instructions regarding handling poisonous agro chemical before, during and after spraying operations should be provided on sprayer.

16. TECHNICAL LITERATURE

Operator manual and parts catalogue is provided with the sprayer.
It is recommended to provide service manual for guidance of user.
The operator manual should be updated as per IS 8132-1999.
The operator manual should contain safety instructions regarding handling poisonous agrochemical before, during and after spraying operation.

TESTING AUTHORITY

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

<table>
<thead>
<tr>
<th>P. K.PANDEY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DIRECTOR</td>
<td>postal</td>
</tr>
</tbody>
</table>

17. APPLICANT'S COMMENTS

We will improve the sprayer at production level.