

THIS TEST REPORT VALID UP TO : 31st DECEMBER, 2025



**CHAKRADHAR 768 TWO STROKE SAMPOORTI
ENGINE OPERATED PORTABLE SPRAYER**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

Northern Region Farm Machinery Training and Testing Institute

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[ISO 9001:2015 CERTIFIED]

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| | | | | |
|---------|---|---|--|-----------------------------|
| xvi) | Tank | Galvanized iron, Brass, Fiber glass reinforced plastics, plastics | Not applicable | -- |
| xvii) | Pipe for agitator | Galvanized iron, Brass, PVC | PVC | Conforms |
| xviii) | Piston (bucket) screw | Brass, stainless steel | Not applicable | -- |
| xix) | Crank case | Aluminum alloy | Not applicable | -- |
| xx) | Roller pump body | Nickel resistant cast iron | Not applicable | -- |
| xxi) | Roller pump and plate | Nickel resistant cast iron | Not applicable | -- |
| xxii) | Roller pump rotor | Nickel resistant cast iron | Not applicable | -- |
| xxiii) | Piston pump crank shaft | Carbon steel | A quadrant gear driven by drive shaft of gear box mounted on plunger rod. | -- |
| xxiv) | Pump inlet port end fitting | Brass | Aluminum | Does not conform |
| xxv) | Piston rod guide | Brass, Aluminum alloy, Gunmetal, Nylon | Not applicable | -- |
| xxvi) | Connecting rod | Carbon steel | N.A. | -- |
| xxvii) | Gudgeon pin | Carbon steel | N.A. | -- |
| xxviii) | Big end bearing | Steel coated with tin base white metal | Not applicable | -- |
| xxix) | Small end bush | Gunmetal | Not applicable | -- |
| 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. | | Not Declared | Does not conform |

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

1. Date of test : 21/11/2018
2. Atmospheric conditions :
 - a) Temperature : 26.0° C
 - b) Relative humidity : 27%
 - c) Pressure : 98.9 kPa

3. Data recorded

| Speed of engine (rpm) | Working pressure (kg/cm ²) | Test No. | Delivery from the discharge line (ml/min) | Overflow (ml/min) | Average delivery from the discharge line (ml/min) | Discharge rate of pump (ml/min) | Hydraulic Power (kW) |
|-----------------------|--|----------|---|-------------------|---|---------------------------------|----------------------|
| 6563 | 7 | 1 | 7600.0 | NIL | 7750.0 | 7750.0 | 0.09 |
| | | 2 | 7800.0 | | | | |
| | | 3 | 7700.0 | | | | |
| | | 4 | 7900.0 | | | | |
| 6545 | 8 | 1 | 7700.0 | NIL | 7625.0 | 7625.0 | 0.10 |
| | | 2 | 7550.0 | | | | |
| | | 3 | 7650.0 | | | | |
| | | 4 | 7600.0 | | | | |
| 6460 | 9 | 1 | 7600.0 | NIL | 7600.0 | 7600.0 | 0.11 |
| | | 2 | 7600.0 | | | | |
| | | 3 | 7650.0 | | | | |
| | | 4 | 7550.0 | | | | |
| 6403 | 10 | 1 | 7400.0 | NIL | 7445.0 | 7445.0 | 0.12 |
| | | 2 | 7650.0 | | | | |
| | | 3 | 7350.0 | | | | |
| | | 4 | 7380.0 | | | | |

Minimum discharge rate = 7445.0 ml/min at 10 kg/cm²
Maximum discharge rate = 7750.0 ml/min at 7 kg/cm²
Discharge at rated pressure = 7750.0 ml/min at 7 kg/cm²

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

Rated pressure, kg/cm² : 7
Engine speed corresponding to rated pressure (rpm) : 6563
Theoretical cubic capacity of pump, ml : 8001.0

Actual volume at rated pressure, ml : 7750.0
Volumetric efficiency, % : 97

5. POWER REQUIREMENT

During the pump operation from minimum to maximum pressure range, the max. Hydraulic power was observed as 0.12 kW against the declared net power output of engine as 0.72 kW.



16. COMMENTS AND RECOMMENDATIONS

- 16.1 The sprayer year of manufacture is not specified. It should be specified.
- 16.2 The spray gun is not designated and marked by identification mark. The identification mark as specified by relevant Indian Standard, **MUST** be provided.
- 16.3 The pump make, model, serial No & country of origin & year of manufacture are not specified. It **MUST** be specified.
- 16.4 The spray nozzle is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard, **MUST** be provided.
- 16.5 The strainer in nozzle is not provided. It may be considered for providing
- 16.6 The manufacture's name or recognized trade mark and batch or code number on nozzle is not provided. It **MUST** be provided.
- 16.7 The spray gun manufacturer's name or recognized trade mark & batch or code number is not marked on gun. It **MUST** be marked.
- 16.8 The discharge rate for fine cone spray pattern & jet spray pattern of spray gun at the pressure of 600 kPa does not conform to the requirement of IS: 3652:1995. It **MUST** be looked into for appropriate improvement
- 16.9 The discharge rate for fine cone spray & 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.
- 16.10 At rated pressure of 7 kg/cm², the pump discharge was observed as 7750.0 ml/min against the minimum requirement of 8000 ml/min. This **MUST** be examined.
- 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 As an important thing as pressure regulator was found "not working". It **MUST** be looked into.
- 16.13 A suitable pressure gauge **MUST** be provided on sprayer as per the specification specified by Indian Standard.
- 16.14 The thickness of the wall of the barrel does not conform to the requirement of Indian Standard. It **MUST** be looked into.
- 16.15 The pump inlet port end fitting material does not meet the requirement of Indian Standard, It **MUST** be looked into.
- 16.16 The diameter of connecting rod of spray gun does not conform to the requirement of Indian standard. It **MUST** be looked into.
- 16.17 The material used for different components are not declare. It should be declare.
- 16.18 A suitable labeling plate (not sticker) needs to be provided with, inter alia, following information;-
- Manufacturer's name
 - Make
 - Model
 - Month & year of manufacture

- v. Rated speed
- vi. Rated pressure
- vii. Discharge rate
- viii. Power rating of engine
- ix. SFC of engine

16.19 Safety provision/safety wear

- i) Safety instruction regarding handling poisonous agro chemicals before, during and after spraying operation should be provided on sprayer.

17. TECHNICAL LITERATURE

The following literature was provided with sprayer to the user .

- i) Instruction manual and parts catalogue of sprayer.

The following literature MUST be provided with the sprayer :-

- i) Service manual of engine, instruction manual should be updated as per IS 8132 :1999.

TESTING AUTHORITY

| | |
|--|---------------------|
| R. K. NEMA SENIOR AGRICULTURAL ENGINEER | <i>Ran</i> |
| P. K. PANDEY DIRECTOR | <i>4301 - 1m58y</i> |

18. APPLICANT'S COMMENTS

No specific comments received from the applicant.

