

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS-389/2304/2019

माह/Month : April, 2019

THIS TEST REPORT VALID UP TO : 30th APRIL, 2026



**ALAP, AHP-2S
ENGINE OPERATED KNAPSACK 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

ट्रेक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001

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

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)
6528	10	1.	7200	NIL	7200	7200	0.12
		2.	7220				
		3.	7190				
		4.	7190				
6453	11.7	1.	7150	NIL	7140	7140	0.14
		2.	7130				
		3.	7160				
		4.	7120				
6305	13.3	1.	6940	NIL	6930	6930	0.15
		2.	6880				
		3.	6960				
		4.	6940				
6233	15	1.	6850	NIL	6817.5	6817.5	0.17
		2.	6830				
		3.	6840				
		4.	6750				

Minimum discharge rate = 6817.5 ml/min at 15 kg/cm²
Maximum discharge rate = 7200 ml/min at 10 kg/cm²
Discharge at rated pressure = 7200 ml/min at 10 kg/cm²

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

Date : 03.04.2019
Rated pressure, kg/cm² : 10
Engine speed corresponding to rated pressure (rpm) : 6528
Theoretical cubic capacity of pump, ml : 7655.44
Actual volume at rated pressure, ml : 7200
Volumetric efficiency, % : 94

5. POWER REQUIREMENT

During the pump operation from minimum to maximum pressure range, the max. hydraulic power was observed as 0.17 kW against the declared net power output of engine as 0.75 kW.

6. ENGINE PERFORMANCE TEST

In pursuance of Ministry's order No. 7-23/2011-M&T (I&P) dated 20.04.2011 the engine performance test has not been conducted and the specifications/performance as specified by the applicant/ declared in the manual have been endorsed.

S.No.	Parameter		Declaration
i	Engine Type	:	Single cylinder 2 stroke air cooled spark ignition engine.
ii	Bore,(mm)	:	33
iii	Stroke (mm)	:	30
iv	Displacement,(cc)	:	26
v	Net power out put	:	0.75 kW@ 6500 rpm
vi	Max Torque	:	1.1 Nm at @ 6000 rpm

7. PRESSURE ADJUSTMENT TEST (Vide clause 8.7.1 of IS: 11313-2007)

1. Date of test : 13.03.2019
2. Atmospheric conditions :
 - a. Temperature : 27 °C
 - b. Relative humidity : 39 %
 - c. Pressure : 98.9 kPa
3. Data recorded

S. No.	Working pressure(kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	10	NIL	NIL	--
2.	11.67	NIL	NIL	--
3.	13.34	NIL	NIL	--
4.	15.0	NIL	NIL	--

4. Resistance of pressure: Yes

8. TEST FOR HYDRAULIC SPRAY GUN

[vide Clause 7.3(b) of IS- 11313: 2007 & Annex E of IS- 3652; 1995]

Date of test : 13.03.2019
Type of gun : Screw type

8.1 TEST FOR DISCHARGE RATE OF SPRAY GUN

The discharge rate for fine cone spray & jet spray pattern as 2000 ml/min & 3130 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 : 1807.5 ml/min
- For jet spray pattern : 3462.5 ml/min

Remarks – The observed discharge rate for jet spray pattern was not within limit specified by the relevant code/standard.

8.2 TEST FOR SPRAY ANGLE OF SPRAY GUN

The spray angle for fine cone spray pattern at a pressure of 600±60 kPa was declared as 65 degree by the applicant. The same was observed as 73.2 degree.

Remarks: The observed spray angel for fine cone spray pattern at the pressure of 600 ± 60 kPa was observed not within the limit specified by the relevant code/standard.

16. COMMENTS AND RECOMMENDATIONS

- 16.1 The sprayer serial number is not specified. It **MUST** be specified.
- 16.2 The sprayer year of manufacture is not specified . It should be specified.
- 16.3 The spray gun is not designated and marked by identification mark. The identification mark as specified by relevant Indian Standard **MUST** be specified.
- 16.4 The pump manufacturing year, serial No & Country of origin is not specified. It **MUST** be specified.
- 16.5 The pump inlet port end fitting material does not meet the requirement of Indian Standard, It **MUST** be looked into.
- 16.6 The spray nozzle is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard, **MUST** be provided.
- 16.7 The strainer in nozzle is not provided. It may be considered for providing
- 16.8 The manufacture's name or recognized trade mark and batch or code number on nozzle is not provided. It **MUST** be provided.
- 16.9 The spray gun batch or code number is not marked on spray gun. It **MUST** be marked.
- 16.10 The diameter of connecting rod is less than the value specified in the relevant code/Standard. It **MUST** be improved.
- 16.11 The thickness of wall of barrel does not meet the requirement of relevant code/Standard. It **MUST** be improved.
- 16.12 The discharge rate for jet spray of gun at pressure at 600 kPa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 16.13 The discharge rate for fine cone spray pattern 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.
- 16.14 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 for further improvement.
- 16.15 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.
- 16.16 At rated pressure of 10 Kg/cm² the pump discharge was observed as 7200 ml/min. against the minimum requirement of 8000.0 ml/min. This **MUST** be examined.
- 16.17 The pressure gauge with fuel scale reading 100 kg/cm² is provided, thus it does not conform to requirement of IS: 11313-2007. It **MUST** be looked into.
- 16.18 Though a pressure regulator provided but that was not in working condition therefore its conformity to IS: 11313-2007 could not be ascertained. It **MUST** be looked into for corrective action.
- 16.19 Suction strainer apertures size does not meet the requirement of relevant code/standard. It **MUST** be looked into.



16.20 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

16.21 Safety provision/safety wear

- i) Ear protector must be added in safety wear.
- ii) Safety instructions regarding handling poisonous agro-chemical before, during and after spraying operations should be provided on sprayer.

17. TECHNICAL LITERATURE

The following literatures are provided with sprayer for guidance to the user.

- i) Service manual and parts catalogue of pump and sprayer
- ii) Operator's manual of engine.

The following literature **MUST** be provided with the sprayer :-

- i) Operator's manual of sprayer.

The operator instruction manual of sprayer needs to be updated as per IS 8132-1999.

TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	<i>Ra</i>
P. K. PANDEY DIRECTOR	<i>U. B. - M. S. B.</i>



18. APPLICANT'S COMMENTS

No comments received from applicant.