

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS-434/2508/2020
माह/Month : September, 2020

THIS TEST REPORT VALID UP TO : 30th SEPTEMBER, 2025



**FORTUNEAGRO, FAI-16 DELUXE
BATTERY 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

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[ISO 9001:2015 CERTIFIED]

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	-Nipple	Brass, Engineering plastic, stainless steel,	Not applicable	--
	-Valve	Brass, synthetic rubber, plastic, stainless steel	Plastic	Conforms
	-Strainer	Brass, stainless steel, plastic	Plastic	Conforms
	-Operating knob	Brass, Engineering plastic	Not applicable	--
	- Operating trigger	Steel, Engineering plastic	Engineering plastic	Conforms
	-Spring	Stainless steel,	Stainless steel	Conforms
	-Gasket	Synthetic rubber, fiber, PVC	PVC	Conforms
	-Gland seal	PVC	PVC	Conforms
	-Gland packing	Asbestos rope	Not applicable	--
xxxiii)	Material of construction of various components as per IS: 3906-1995			
	Strap	Woven web cotton/synthetic yarn	Woven Web Cotton	Conforms
	Skirt/Stand	Steel, plastic	Plastic	Conforms
	Strap buckle	Steel, Engg. Plastic	Engg. Plastic	Conforms
	Cushion	Foam, rubber, foam plastic	Foam	Conforms
xxxiv)	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.		Declared by the applicant	Conforms

3. TEST FOR DISCHARGE RATE OF PUMP (Vide Clause 8.3 of IS – 11313: 2007)

1. Date of test : 10.02.2020
2. Atmospheric conditions :
 - a) Temperature : 20.4 °C
 - b) Relative humidity : 54.4 %
 - c) Pressure : 99.5 kPa
3. Data recorded

Speed of Pump (rpm)	Pressure (kg/cm ²)	Test No.	Delivery from the discharge line (ml/min)	Overflow (ml/min)	Average discharge from the discharge line (ml/min)	Discharge rate of pump (ml/min)
3593	1	1	2800	NIL	2852.5	2852.5
		2	2900			
		3	2860			
		4	2850			
3480	2	1	2110	NIL	2010.0	2010.0
		2	2000			
		3	1980			
		4	1950			
3434	3	1	1740	NIL	1667.5	1667.5

		2	1630			
		3	1660			
		4	1640			
3337	4	1	1380	NIL	1280.0	1280.0
		2	1260			
		3	1230			
		4	1250			

Minimum discharge rate = 1280.0 ml/min at 4 kg/cm²
Maximum discharge rate = 2852.5 ml/min at 1 kg/cm²
Discharge at rated pressure = 1667.5 ml/min at 3 kg/cm²

4. TEST FOR VOLUMETRIC EFFICIENCY (Vide Clause 8.4 of IS – 11313: 2007)

Rated pressure, kg/cm² : 3
Avg. discharge of water at rated pressure, ml/min : 1667.5
Avg. discharge of water at no-load, ml/min : 3617.5
Avg. pump speed at no-load, rev/min : 3900
Avg. pump speed at rated pressure, rev/min : 3434
Volumetric efficiency of pump, % : 52

Remarks: The volumetric efficiency does not conform to the requirement of IS: 11313:2007.

5. POWER REQUIREMENT (Vide Clause 8.5 of IS – 11313 : 2007)

Power requirement of DC motor fitted on sprayer was observed as following:-

1. Motor operating voltage : 12 V
2. Avg. current drawn by motor at no load : 1.12 A
3. Avg. current drawn by motor at load : 2.10 A
4. Avg. motor operating voltage : 12.37 V
5. Avg. observed motor power requirement : 26.01 watt
6. Avg. motor speed at no load : 3880 rpm
7. Avg. motor speed at load : 3440 rpm
8. Avg. time required for fully discharge of battery : 6.5 to 7 h
9. Avg. No load rpm of motor after 6 hours of operation : 2485 rpm

6. PRESSURE ADJUSTMENT TEST

1. Date of test : 10.02.2020
2. Atmospheric conditions:-
a. Temperature : 20.4 °C
b. Relative humidity : 54.4 %
c. Pressure : 99.5 kPa
3. Data recorded



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Cl.7.3.5	Each spray shall be provided with a set of mask, hand gloves and safety goggles.	Mask, goggles, gloves, ear protector, apron and gum boots are provided.	Conforms
Cl.8 Workmanship & Finish	The components of the sprayer shall have a smooth finish and shall be free from pits burrs, sharp edges and other defects that may be detrimental for their use.	Satisfactory	Conforms
Cl. 8.2	The exposed mild steel parts shall have a protective coating to prevent surface deterioration. The steel used for hose ferrule/clip shall be plated with cadmium, zinc or nickel exposed brass parts may be given a suitable protective finish with clear transparent lacquer.	Metallic part is coated with enamel paint.	Conforms
Cl. 9 Marking & Packing	Each sprayer shall be marked with the following particulars		
Cl. 9.1 Marking	a)Manufacturers name or recognized trade mark	Fortuneagro FAI-16 Deluxe	Conforms
	b)Batch or serial no.	765445	Conforms
	c)Tank nominal capacity	16 lt.	Conforms
Cl.9.3 IS:3906-1995 Packing	Each sprayer shall be packed as agreed to between the purchase and the supplier for safe handling in transit.		

15. CRITICAL TECHNICAL SPECIFICATIONS

(Deferred till 31.12.2020 vide Ministry's O.M. No 13-13/2020 M &T (I & P) dated 24.04.2020)

16. CONFORMITY TO INDIAN STANDARDS

- i) IS: 11313:2007 Hydraulic power sprayers- : Does not conform in toto specification
- ii) IS: 10134-1994-Method of test for manually operated sprayer : Does not conform in toto
- iii) Spray nozzle and spray gun as per IS:3652-1995 (Reaffirmed 2011) : Does not conform in toto
- iv) IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation : Does not conform in toto

17. COMMENTS & RECOMMENDATIONS

- 17.1 The battery charger model is not specified. It should be specified
- 17.2 The motor serial number and speed is not specified. It should be specified.
- 17.3 The pump model, country of origin and serial number is not specified. It should be specified.
- 17.4 The material of pump inlet port end fitting does not conform the requirement of relevant code/standard. It **MUST** be looked into.
- 17.5 The manufacturer's name or recognized trade mark and batch or code number of cut off device is not marked. It **MUST** be looked into.

- 17.6 The strainer in nozzle is not provided. It may be considering for providing.
- 17.7 The volumetric efficiency of pump does not meet the requirement of Indian Standard. It **MUST** be improved.
- 17.8 Agitator is not provided. It may be provided.
- 17.9 The strap cushion thickness does not meet the requirement of Indian Standard. It may be looked into.
- 17.10 The current drawn by motor at no load and on load was observes as 1.12 A and 2.10A respectively which does not conform to requirement of IS- 14459: 1997.
- 17.11 Time required to full charge the battery with AC charger is observed as 8.5 to 9 hours.
- 17.12 The spraying operation time after fully charging the battery was observed as 6.5 to 7 hours.
- 17.13 During the pump chamber hydraulic test the motor stopped beyond 5.5 kg/cm² pressure against the pressure requirement of 7.5 kg/cm² and the test could not be conducted. This **MUST** be looked into and improved.
- 17.14 The discharge rate of nozzle for fine cone spray pattern and Jet spray pattern does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 17.15 The dimension of metallic threaded connection does not conform to the requirement of relevant /code Standard. It **MUST** be looked into.
- 17.16 During the strap drop test the buckle/bracket of strap assembly found failed to hold the strap in it's position. It should be improved.
- 17.17 The average size of strainer of cut off device does not meet the requirement of Indian Standard. It **MUST** looked into.
- 17.18 No necessary tools are provided with sprayer. It **MUST** be provided.
- 17.19 The back rest cushion is not provided with sprayer. It **MUST** be provided.
- 17.20 Percentage variation in discharge rate for fine cone spray pattern from first to last collection of endurance test of nozzle does not conform to the requirement of relevant Code/Standards. It **MUST** be looked into.
- 17.21 The strap width does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 17.22 The discharge outlet nipple length does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 17.23 Nominal length of spray lance does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 17.24 Spray angle of nozzle at 300 kPa pressure does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 17.25 **Safety provision/Safety wear**
Safety instruction regarding handling poisonous agro-chemical before, during and after spraying operation should be provided on sprayer.


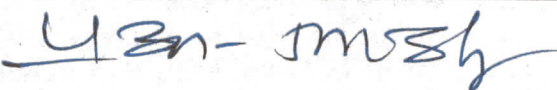


18. TECHNICAL LITERATURE

No technical literatures are provided with sprayer for guidance to the users. It is therefore recommended to provide **operator manual** as per IS: 8132-1999.

In addition service manual and part catalogue may also be provided for guidance of users.

TESTING AUTHORITY

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY DIRECTOR	

19. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's Comments
19.1	17.1 to 17.25	We inform to take care the corrective actions, and in future supply, above points will be considered before dispatch of material.

