

THIS TEST REPORT VALID UP TO : 31st August, 2028



**FARMAK, FM-16B
BATTERY OPERATED KNAPSACK SPRAYER**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि एवं किसान कल्याण विभाग

Department of Agriculture and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

Northern Region Farm Machinery Training and Testing Institute

ट्रैक्टर 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: fnti-nr@nic.in

Tele./FAX: 01662-276984

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3. Data recorded

Avg. Speed of Pump (rpm)	Working 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)
4113	1.0	1	3640	NIL	3615.0	3615.0
		2	3580			
		3	3610			
		4	3630			
4106	2.0	1	3140	NIL	3135.0	3135.0
		2	3130			
		3	3150			
		4	3120			
4090	3.0	1	2080	NIL	2075.0	2075.0
		2	2050			
		3	2070			
		4	2100			
3398	4.0	1	1340	NIL	1325.0	1325.0
		2	1300			
		3	1320			
		4	1340			

Minimum discharge rate = 1325.0 ml/min at 4 kg/cm²
Maximum discharge rate = 3615.0 ml/min at 1 kg/cm²
Discharge at rated pressure = 2075.0 ml/min at 3 kg/cm²

6. TEST FOR VOLUMETRIC EFFICIENCY
(Vide Clause 8.4 of IS: 11313 -2007)

Date of Test : 27.04.2023
 Rated pressure, kg/cm² : 3.0
 Avg. discharge of water at rated pressure, ml/min : 2075.0
 Avg. discharge of water at no-load, ml/min : 4395.0
 Avg. pump speed at no-load, rev/min : 4433
 Avg. pump speed at rated pressure, rev/min : 4090
 Volumetric efficiency of pump, % : 51.17

Remark:- The volumetric efficiency does not conform to the requirement of IS:11313-2007

7. POWER REQUIREMENT
(Vide Clause 8.5 of IS : 11313-2007)

Date of test : 27.04.2023
 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 : 1.85 A
3. Avg. current drawn by motor at load : 2.84 A
4. Avg. motor operating voltage : 12.64 V
5. Avg. observed motor power requirement : 35.90 watt
6. Avg. motor speed at no load : 4433 rpm



7. Avg. motor speed at load : 4090 rpm
 8. Avg. time required for fully discharge of battery : 7.0 to 8.0 hours
 9. Avg. no load rpm of motor after 6 hours of operation : 3891 rpm
 10. Time required to fully charge the battery with AC charger was observed as : 6.0 to 7.5 hours
 11. The spraying operation time after fully charging the battery was observed as : 6.2 to 7.8 hours

8. PRESSURE ADJUSTMENT TEST

1. Date of test : 27.04.2023
 2. Atmospheric conditions
 a. Temperature : 35.4 °C
 b. Relative humidity : 22.4 %
 c. Pressure : 98.2 kPa
 3. Data recorded

Sr. No.	Working pressure (kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	1.0	NIL	NIL	--
2.	2.0	NIL	NIL	--
3.	3.0	NIL	NIL	--
4.	4.0	NIL	NIL	--

4. Resistance to different pressure: Yes

9. TEST FOR SPRAY LANCE (Vide Annex D of IS: 3652 –1995)

- Date of test : 26.04.2023
 Type : Gooseneck (Type-B2)

9.1 STRENGTH OF SPRAY LANCE

Sr. No	Details	Condition
1	Test Condition	Outlet closed
2	Hydraulic pressure applied	1 MPa
3	Duration of pressure retained	5 minutes
4	Result	No leak, crack, or bursting of lance was observed during test

9.2 MARKING ON SPRAY LANCE

- Manufacturer's name or recognized trade mark : **Not marked**
 Nominal length : **Not marked**
 Batch or code number : **Not marked**

10. TEST FOR CUT-OFF DEVICE (Vide Annex C Clause 6.8.3 of IS: 3652–1995)

- Date of test : 26.04.2023
 Type : Trigger type (Type-A)



16.	Making/labelling of sprayer	The labelling plate should be provided on the body of sprayer having name & address of manufacturer, month & year of manufacture, rated pressure, discharge rate, country of origin.	A metallic labelling plate is provided on the sprayer with following information Make: Farmak Model: FM-16B Machine Serial no. VR20222304765 Mfg: VR Agro Equipments D.N. 299/A, Koilkuntla Road, Allagadda-518543, Nandyal, Distt. Andhra Pradesh	Conforms
17.	Literature	Operator manual, service manual & parts catalogue should be provided.	Provided	Conforms

18. CONFORMITY TO INDIAN STANDARDS

- i) IS: 11313-2007 Hydraulic power sprayers- : **Partially conform**
specification
- ii) IS: 10134-1994-Method of test for manually : **Partially conform**
operated sprayer
- iii) Spray nozzle and spray gun as per IS:3652-1995 : **Partially conform**
(Reaffirmed 2011)

19. COMMENTS & RECOMMENDATIONS

- 19.1 The make & model of motor is not specified. It **MUST** be looked into.
- 19.2 The discharge rate of nozzle at a pressure of 300 kPa for jet spray pattern does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 19.3 The strainer in nozzle is not provided. It may be provided.
- 19.4 The manufacturer's name or recognized trade mark, batch or code number and designation of nozzle is not marked. It **MUST** be looked into.
- 19.5 During the hydraulic test of pump chamber, the motor stopped beyond 5.8 kg/cm² pressure against the pressure requirement of 7.5 kg/cm² and test could not be conducted. It **MUST** be looked into and improved.
- 19.6 The volumetric efficiency of pump does not meet the requirement of Indian Standard. It **MUST** be improved.
- 19.7 The manufacturer's name or recognized trade mark, nominal length and batch or code number of lance is not marked. It **MUST** be looked into.
- 19.8 The manufacturer's name or recognized trade mark, type of cut off device and batch or code number is not marked. It **MUST** be looked into.



- 19.9 Agitator is not provided. It may be provided.
- 19.10 The safety wear is not provided. It **MUST** be provided.
- 19.11 The strainer in cut off device is not provided. It **MUST** be looked into.
- 19.12 During the strap drop test, the buckle/bracket of strap assembly failed to hold the strap in its position. It should be improved as per relevant standard.
- 19.13 The strap cushion thickness does not meet the requirement of Indian Standard. It may be looked into.
- 19.14 The discharge outlet nipple length does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 19.15 **Safety provision /safety wear.**
- i) The safety instructions regarding handling poisonous agro-chemical before, during and after spraying operators should be provided on sprayer.


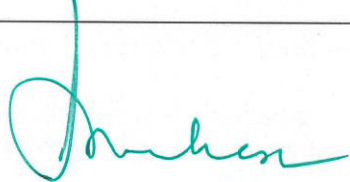
20. TECHNICAL LITERATURE

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

- i. Operator manual
- ii. Service manual
- iii. Parts catalogue

However, the manuals of sprayer should be updated as per IS:8132-1999

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 17.08.2023

The test report is compiled by Sh. Abhishek Chourey, MTS (Technical)

21. APPLICANT'S COMMENTS

We will take corrective action in our future production.

