प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट
INITIAL COMMERCIAL TEST REPORT

संख्या/No. CSIR/CMERI/FMTTC/2023/017
माह/Month: August, 2023

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

BIRSA AGRO MACHINERY
BATTERY OPERATED KNAPSACK SPRAYER
(MODEL - KS-12/12)

कृषि मशीनरी प्रशिक्षण और परीक्षण केंद्र
Farm Machinery Training and Testing Centre
सीएसआईआर- केन्द्रीय यांत्रिक अभियांत्रिकी अनुसंधान संस्थान
CSIR - Central Mechanical Engineering Research Institute
महात्मा गांधी एवेन्यू, दुर्गापुर
Mahatma Gandhi Avenue, Durgapur
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Name & Address of Applicant : M/s. Birsa Agro Machinery
Dumka Road, Maheshpur, Pakur,
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Test Conducted at : Farm Machinery Training and Testing Centre
CSIR- Central Mechanical Engineering Research Institute, M G Avenue, Durgapur, Pin – 713209, West Bengal.

THIS TEST REPORT VALID UP TO: 31/08/2028

[vide DAC&FW OM No. 13-24/2018 – M&T (I&P) dated 19.09.2018]

Report No.: CSIR/CMERI/FMTTC/2023/017 **Month: August** **Year: 2023**

CSIR - Central Mechanical Engineering Research Institute,
Durgapur - 713209
(W.B.), INDIA

1.3 Battery (As per Sticker)

Type	:	Sealed, Lead-Acid Battery
Make	:	DUAL POWER
Model	:	DP DUAL POWER
Serial number	:	SE-05-23
Capacity & rating	:	12V, 14AH
Country of origin	:	INDIA
Location	:	Below the chemical tank.

1.4 Battery Charger from AC Supply

Make	:	UNI-POWER CHARGER
Model	:	ODS-04F
Input voltage	:	AC220V 50/60 HZ
Output voltage	:	DC 12V
Output current	:	1.7A
Country of origin	:	**Not specified**

1.5 Pump

Type	:	Diaphragm
Make	:	EARTH
Model	:	4002
Sr. number	:	P21/07C
Method of drive	:	Off/ On Switch
Working pressure, kg/cm^2	:	1 - 4
Rated pressure, kg/cm^2	:	3
Rated speed, rpm	:	2900
Discharge capacity at rated pressure, l/min	:	1.9
Country of origin	:	**Not specified**
Mounting arrangement	:	Battery, motor & pump is mounted below the chemical tank

1.6 Chemical Tank

Material of construction	:	PVC
Size (mm)	:	350 x 340 x 165
Capacity (l)	:	18
Location	:	Above battery, motor and pump mounting

1.7 Agitating Device : Not provided.
However, there is a pump in equipment through which excess pumped spray solution returned to the tank. This returned spray solution full-fill the agitation of spray solution.

1.8 Nozzle

Type of nozzle	:	Flat fan, Fixed hollow cone (4 hole & 8 hole), Double hole Nozzle type
Nozzle designation	:	Not Marked
Number of nozzle	:	Four

1.9 Mounting arrangement : Battery, motor and pump is mounted beneath the chemical tank

1.10	**Accessories (for operator's safety against pesticides)**	:	Mask, hand gloves and goggles are provided.
1.11	**Overall Dimensions, mm**		
	Height	:	490
	Width	:	395
	Length	:	200
1.12	**Total Mass, kg**		
1.12.1	**Mass with all accessories and chemical tank, kg**	:	6.17
1.12.2	**Mass with accessories and chemical tank full, kg**	:	24.17
1.13	**Identification/Labelling plate**	:	i) The following text is printed on the tank of the sprayer

KISHAN SATHI
MODEL-KS-12/12
Mfg. By
BIRSA AGRO MACHINERY

C-10 MARKING	Each cut-off device shall be marked with the following particulars:		
a)	Manufacturer's name or recognized trade-mark,	Not marked	**Does not confirm**
b)	Batch or code number, and	Not marked	**Does not confirm**
c)	Type of cut-off device.	Not marked	**Does not confirm**
14.5 OTHER REQUIREMENTS AS PER IS: 3652-1995			
F-3.1 Rate of discharge F-3.1.1	The discharge rate of the nozzle shall be declared by the manufacturer. In case of adjustable nozzle, the declared value shall be for extreme adjustments for cone and jet spray patterns at a pressure of 300 kPa.	Declared as 1.2 l/min for hollow cone spray pattern by the manufacturer.	Conforms
F-3.1.2	When tested in accordance with F-7, The nozzles shall provide a rate of discharge as given in Table-3. The rate of discharge shall be within ± 5 percent for fixed type and ±10 percent for adjustable type of nozzle, of the declared value.	Withstand the test. (Refer chapter 10 clause 10.1 of this test report).	Conforms
F-3.2 Spray Angle	The spray angle of the nozzle shall be declared by the manufacturer. The angle, when tested in accordance with method given in F-9 shall not differ by ±3 deg. for fixed type and ±5° for adjustable type nozzles from the declared value	The spray angle of nozzle is measured between 93° to 95°. The spray angle value is 90° declared by the manufacturer.	Conforms
F-3.3 Endurance test	The hydraulic spray nozzle when test in accordance with F-7 & F-9 at a pressure of 300±30 kPa for 48 hrs. duration with continuous stretches of 6 hrs. variation in discharge rate and spray angle from initial values should not be more than 5% and 3 degree respectively.	Withstand the test (Refer chapter 10 clause 10.3 of this test report).	Conforms
F-4 Other Requirements F-4.1	If strainer is provided, the average size of any side or diameter of the apertures shall be not more than 450 µm.	Strainer is not provided in nozzle.	–
F-4.2	At the option of the purchaser the provision shall be made for rotating the nozzle by hand to make it swivel type.	NA	–

F-5 Designation F-5.1	The cone and fan nozzle shall be designated by its identification mark, spray angle and discharge rate. An adjustable nozzle shall be designated by its identification mark AN-C-J for cone and Jet spray pattern and discharge rate at a controlled pressure of 300 kPa.	Not marked	**Does not confirm**
F-6 Workmanship & Finish F-6.1	The components of the spray nozzles shall be free from burrs and other defects; this applies particularly to the internal surfaces and specially to the orifice.	No noticeable defect observed.	Conforms
F-6.2	The mating faces of the cap, tip and nozzle body or boss, shall be finished flat so as to seal on the end face of the nozzle body or boss, a gasket may be used, if necessary.	Mating faces of nozzle body is provided with gaskets to seal on the end face of nozzle body.	Conforms
F-6.3	The screw thread shall be well formed and the crests of the threads shall be free from burrs or any other defects which may prevent free engagement.	Satisfactory	Conforms
F-11 Marking	Each nozzle shall be marked with following particulars:-		
	a) Manufacturer's name & recognized trade mark	Not marked	**Does not confirm**
	b) Nozzle designation	Not marked	**Does not confirm**
	c) Batch or code number	Not marked	**Does not confirm**

15. TEST FOR STRAP AND ITS ASSEMBLY

(Vide Clause 7.3 of IS 10134-1994)

Date of test: 31.07.2023

The sprayer was filled with clean water to its specified capacity. The sprayer was hung from a solid support by its straps simulating its carriage on the shoulder of an operator. The tank was vertically raised to height of 300 mm and was allowed to drop freely and hung by straps.

Observation: No damage was observed during testing.

18. TECHNICAL LITERATURE

The operator, maintenance & parts manual of sprayer was provided during the test which found adequate, however, the manual should be updated as per IS: 8132:1999, with the inclusion of safety instructions regarding handling poisonous agrochemical and first aid.

TESTING AUTHORITY

Report Prepared by	Sr. Technical Officer, CSIR-CMERI Farm Machinery Testing Centre	
Report Verified by	Scientist, CSIR-CMERI Farm Machinery Testing Centre	
Report Approved by	In-Charge, CSIR-CMERI Farm Machinery Testing Centre	Subrata ki Mondal
Report Approved for release by	Head, Business Development Group, CSIR-CMERI, Durgapur	

19. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comments
19	17.1 – 17.12	Noted, corrective actions will be taken against the given comments & Recommendations from 17.1 to 17.12
	17.13 & 17.14	Noted