

प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट

INITIAL COMMERCIAL TEST REPORT

संख्या/No. CSIR/CMERI/FMTTC/2023/008

माह/Month: August, 2023

THIS TEST REPORT VALID UP TO

:

31st AUGUST, 2028



GL101

BATTERY OPERATED KNAPSACK SPRAYER



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

पश्चिम बंगाल - **713209**

West Bengal - 713209

Website: <https://cm eri.res.in>

E-mail: fmttc_cm eri@gmail.com

Telephone: +91-343-2546749; 9434921623

Fax: +91-343-2546745

Type of Test	: Initial Commercial Test
Test Code/Procedure	: IS-3906:1995, IS: 10134:1994 IS: 3652:1995 & IS: 11313:2007
Period of Test	: May 2023 to June 2023
Test Report No.	: CSIR/CMERI/FMTTC/2023/008
Month and Year	: August, 2023

- The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
- The data given in this report pertain to the particular machine submitted by the applicant for test.
- The results presented in this report do not in any way attribute to durability of the machine.
- The report should not be reproduced in part or full without prior permission of the Director, CSIR-Central Mechanical Engineering Research Institute, Durgapur -713209 (West Bengal)
- This test report is not covered under BIS certification. Therefore, the manufacturers cannot market the sprayer with ISI mark, only on the strength of this report.
- This report can not be used for legal purposes.

SELECTED CONVERSIONS

- Force**
 1 kgf = 9.80665 N
 = 2.20462 lbf
- Power**
 1 HP = 1.01387 Metric HP (Pa)
 = 745.7 W
 1 Ps = 735.5 W
- Pressure**
 1 psi = 6.895 kPa
 1 kgf/sq.cm = 98.067 kPa = 735.56 mm of Hg
 1 bar = 100 kPa = 10 N/sq.cm
 1 mm of Hg = 1.3333 m-bar
- Area**
 1 ha = 10000 m² = 2.471 Acres



1.3 Battery (As per Sticker)

Type	: Sealed, Lead-Acid Battery
Make	: JIUIA
Model	: Not specified
Serial number	: LS202211D20
Capacity & rating	: 12V, 8AH/ 20HR
Country of origin	: Not Specified
Location	: Below the chemical tank.

1.4 Battery Charger from AC Supply

Make	: GALAXY
Model	: 90611A-B
Input voltage	: AC 220V
Output voltage	: DC 12 V
Output current	: 1.1 A
Country of origin	: Not specified

1.5 Pump

Type	: Diaphragm
Make	: GALAXY
Model	: Not specified
Sr. number	: V22/05D
Method of drive	: Off/ On Switch
Working pressure, kg/cm ²	: 1 to 4
Rated pressure, kg/cm ²	: 3
Rated speed, rpm	: 2600
Discharge capacity at rated pressure, l/min	: 2.10
Country of origin	: Not specified
Mounting arrangement	: Battery, motor & pump is mounted below the chemical tank

**1.6 Chemical Tank**

Material of construction	: Plastic
Size (mm)	: 350x335x160
Capacity (l)	: 16
Location	: Above battery, motor and pump mounting

1.7 Agitating Device

: Not required for this type of machine.
 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	: 04

1.9 Mounting arrangement

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

2. CHECKING OF MATERIAL OF CONSTRUCTION

S. No.	Components	Materials (As per IS:11313-2007)	Observation	Remarks
1.	2.	3.	4.	5.
i)	Pump cylinder	Brass, stainless steel, engg. Plastic	Not applicable	--
ii)	Pressure chamber	Brass, stainless steel, engg. Plastic	Not applicable	--
iii)	Piston rod	Stainless steel, engg. plastic	Not applicable	--
iv)	Piston or plunger	Gunmetal, stainless steel, plastics, Rubber, vegetable tanned leather, chrome turned leather	Not applicable	--
v)	Spreader	Brass, stainless steel, plastics	Not applicable	--
vi)	Valve assembly	Brass, Stainless Steel, plastics	Not applicable	Conforms
vii)	Roller pump shaft	Stainless steel	Not applicable	--
viii)	Pump rollers	Nylon filled with lead	Not applicable	--
ix)	Pressure regulators	Brass, stainless steel	Not applicable	--
x)	Suction strainer	Brass, stainless steel, plastics	Plastic	Conforms
xi)	Strainer body	Brass, plastics	Plastic	Conforms
xii)	Gasket	Rubber, PVC, fibre	PVC	Conforms
xiii)	Spray nozzles	Brass, engineering plastic, stainless steel	Plastic	Conforms
xiv)	Spray boom	Mild steel, Galvanized, iron Braided rubber	Not applicable	--
xv)	Hose	Synthetic rubber, P.V.C	PVC	Conforms
xvi)	Tank	Galvanized iron, Brass, Fiber glass reinforced plastics, plastics	Plastic	Conforms
xvii)	Pipe for agitator	Galvanized iron, Brass, PVC	Not applicable	--
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	Not applicable	--
xxiv)	Pump inlet port end fitting	Brass	Plastic	Does not confirm
xxv)	Piston rod guide	Brass, Aluminum alloy, Gunmetal, Nylon	Not applicable	--
xxvi)	Connecting rod	Carbon steel	Not applicable	--
xxvii)	Gudgeon pin	Carbon steel	Not applicable	--
xxviii)	Big end bearing	Steel coated with tin base white metal	Not applicable	--
xxix)	Small end bush	Gunmetal	Not applicable	--

C-4 End-fittings C-4.1	The inlet end-fitting of the cut-off device for connecting the delivery hose, shall be nipple type or thread type. The length of nipple shall be not less than 20 mm.	The inlet end fitting of cut off device for connecting the delivery hose is threaded Type.	Conforms
C-4.2	The outlet end fitting of the cut-off device for connecting the lance shall be of thread type.	The outlet end fitting of cut off device for connecting lance is thread type.	Conforms
C-5 Gaskets	End fittings of thread type shall be provided with gaskets. If fitted to external thread, it shall be recessed for at least one third of its thickness. Where fitted to internal thread it shall at no time obstruct the passage of the liquid.	PVC gasket are provided at end fittings of lance side.	Conforms
C-6 Operating Trigger/Knob C-6.1	The operating trigger in type-A, cut-off device shall be attached with valve stem. A locking device shall be fitted which may be in the form of a ring sliding over the trigger when the valve is in open position.	Operating trigger attached with valve stem & locking device is provided.	Conforms
C-6.2	When tested in accordance with the method given in C 6.2.1 to 6.2.7, the maximum torque required for trigger actuation shall not be more than 3.5 N-m (35 Kgf-cm).	The maximum trigger actuation torque is 12.5 kgf-cm.	Conforms
C-6.3	The operating knob in Type B cut-off device shall be suitably shaped for convenient handling.	Not applicable	--
C-7 TESTS	The cut-off device shall withstand the strength test and leakage and reliability test as given in C-8 and C-9.		
C-8.4	During this test, the cut-off device shall not crack or burst.	No crack or burst of cut off device observed at the application of 750 kPa hydraulic pressure for 5 minutes.	Conforms
C-9 Leakage and reliability test as per IS 3652:1995 C-9.3.5	The cut-off device or spray gun shall be deemed to have passed this test, if it does not drip or leak through the valve.	No sign of leakage through the valve observed after 5000 cycles at 300±30 kPa and 500 cycles of 600 ±60 kPa pressures.	Conforms



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 2.10 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 $\pm 5^\circ$ for adjustable type nozzles from the declared value.	The spray angle of nozzle is measured between 68° to 70° . The spray angle value is 70° 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 μ m.	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	—



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	<i>[Signature]</i> 10/08/23
Report Verified by	Scientist, CSIR-CMERI Farm Machinery Testing Centre	<i>[Signature]</i> 10/08/23
Report Approved by	In-Charge, CSIR-CMERI Farm Machinery Testing Centre	<i>[Signature]</i> 10/8/2023
Report Approved for release by	Head, Business Development Group, CSIR-CMERI, Durgapur	<i>[Signature]</i> 10/8/23

19. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comments
19	17.1 to 17.12	Noted and will be rectify as per your recommendations.
	17.3 and 17.14	Noted.

