

THIS TEST REPORT VALID UP TO : 31st May, 2029



**KARNAL AGRO, GROFARM NEON
TRACTOR OPERATED 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

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[ISO 9001:2015 CERTIFIED]

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xviii)	Piston (bucket) screw	Brass, stainless steel	Stainless Steel	Conforms
xix)	Crank case	Aluminum alloy	Aluminum alloy	Conforms
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	Carbon steel	Conforms
xxiv)	Pump inlet port end fitting	Brass	Brass	Conforms
xxv)	Piston rod guide	Brass, Aluminum alloy, Gunmetal, Nylon	Not applicable	---
xxvi)	Connecting rod	Carbon steel	Carbon Steel	Conforms
xxvii)	Gudgeon pin	Carbon steel	Carbon steel	Conforms
xxviii)	Big end bearing	Steel coated with tin base white metal	Steel coated with tin base white metal	Conforms
xxix)	Small end bush	Gunmetal	Gunmetal	Conforms
xxx)	The material used for different components shall be declared by the manufacturer all the components mentioned in the table-1 may not be present in a particular sprayer.		Not declared by the manufacturer	--

4. RUNNING-IN

Applicant has not recommended running-in of sprayer

5. TEST FOR DISCHARGE RATE OF PUMP [vide Clause 8.3 of IS: 11313–2007]

1. Date of test : 26.04.2022
2. Atmospheric conditions
 - a) Temperature : 40.8 °C
 - b) Relative humidity : 13.6 %
 - c) Pressure : 97.7 kPa
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)	Avg. Overflow (ml/min)	Average discharge from the discharge line (ml/min)	Discharge rate of pump (ml/min)	Hydraulic power (kW)
780	25.0	1	22800	8650	8842.5	22872.5	31715.0	1.3
		2	23100	9000				
		3	22700	8780				
		4	22890	8940				
765	35.0	1	25100	5780	5827.5	24950.0	30777.5	1.8
		2	24650	5750				
		3	24800	5800				
		4	25250	5980				

761	36.5	1	25400	5430	5412.5	25210.0	30622.5	1.8
		2	25000	5500				
		3	25100	5380				
		4	25340	5340				
759	38.0	1	26400	4240	4172.5	26370.0	30542.5	1.9
		2	26250	4150				
		3	26350	4200				
		4	26480	4100				
756	40.0	1	27370	2800	2727.5	27400.0	30127.5	1.9
		2	27450	2710				
		3	27500	2650				
		4	27280	2750				

Minimum discharge rate = 30127.5 ml/min at 40 kg/cm²
 Maximum discharge rate = 31715.0 ml/min at 25 kg/cm²
 Discharge at Rated pressure = 31715.0 ml/min at 25 kg/cm²

6. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP

[Vide clause 8.4 of IS: 11313 -2007]

Date of test : 26.04.2022
 Rated pressure, kg/cm² : 25
 Rated rpm of pump : 800
 Theoretical Volume, ml : 42.39
 Actual volume at rated rpm & rated pressure, ml : 39.64
 Volumetric efficiency, % : 93.51

7. PRESSURE ADJUSTMENT TEST

[Vide Clause 8.7.1 of IS: 11313-2007]

1. Date of test : 26.04.2022
 - a. Atmospheric conditions
 - b. Temperature : 40.8 °C
 - c. Relative humidity : 13.6 %
 - d. Pressure : 97.7 kPa
2. Data recorded

Sr. No.	Working pressure (kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	25.0	NIL	NIL	--
2.	35.0	NIL	NIL	--
3.	36.5	NIL	NIL	--
4.	38.0	NIL	NIL	--
5.	40.0	NIL	NIL	--

3. Resistance to different 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 : 25.04.2022
 Type of gun : Screw type

8.1 TEST FOR DISCHARGE RATE OF SPRAY GUN

The discharge rate for fine cone spray pattern & jet spray pattern as 4000 ml/min & 7000 ml/min at the pressure of 600 kPa was declared by the applicant. The discharge rate corresponding to 600 kPa pressure was observed as below

- For fine cone spray pattern : 6582.5 ml/min
- For jet spray pattern : 8512.5 ml/min

Remarks:- Discharge rate for fine cone spray pattern and jet spray pattern is not within the 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 kPa was declared as 60 degree by the applicant. The spray angle corresponding to 600 kPa pressure was observed as 79.7 degree.

Remarks: The spray angle for fine cone spray pattern at the pressure of 600 kPa is not within the limit specified by the relevant code/standard.

8.3 STRENGTH OF GUN

Sr. No	Details	Condition
1	Condition of nozzle tip	Closed
2	Hydraulic pressure	1500 kPa
3	Duration of pressure	5 Minutes
4	Result	No leak, crack or bursting of gun was observed during test

8.4 SPRAY GUN DESIGNATION : Not marked

8.5 MARKING

Manufacturer's name or recognized : Marked as Basak
trade mark

Batch or code number : Not marked

8.6 ENDURANCE TEST OF GUN

- i) Date : 06.04.2022 to 13.04.2022
- ii) Total running time (h) : 48
- iii) Quantity of liquid collected and spray angle observed during endurance test

Sr. No	Collection	Avg. discharge rate, ml/min		Spray angle, degree
		Fine cone spray pattern	Jet spray pattern	
a)	First collection	6612.5	8335.0	78.5
b)	Second collection	6607.5	8350.0	80.3
c)	Third collection	6635.0	8562.5	79.1
d)	Fourth collection	6590.0	8600.0	79.7
e)	Fifth collection	6687.5	8502.5	77.8
f)	Sixth collection	6590.0	8712.5	78.5
g)	Seventh collection	6657.5	8525.0	77.2
h)	Eighth collection	6662.5	8470.0	79.7

Remarks : (1) Percentage variation of discharge rate at fine cone spray pattern from first to last collection is 0.76 %.

(2) Percentage variation of discharge rate at jet spray pattern from first to last Collection is 1.62 %.

(3) The variation in spray angle of gun at fine cone spray pattern from first to last collection is 1.2 degree.

16	Marking/labelling of machine	The labelling plate should be riveted on the body of machine having Name and address of manufacturer, Country of origin, Make, Model, Year of manufacturer, Serial number, Type, size, required size of prime mover (kW)	Provided	Conforms
17	Literature	Operator manual, service manual & parts catalogue must be provided in English, Hindi, Local language.	Provided	Conforms

Note:- The implementation of the critical technical specification has been deferred till 30.09.2022 vide ministry's O.M No. 13-1/2021 M&T (I&P) dated 03.02.2022

16. CONFORMITY TO INDIAN STANDARDS

- i) IS:11313-2007 (Reaffirmed 2012)-Hydraulic power sprayer-specification : **Partially conform**
- ii) Spray nozzle and spray gun as per IS:3652-1995 (Reaffirmed 2011) : **Partially conform**
- iii) Hose and hose connection as per IS:10134-1994 : **Conforms**
- iv) IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation. : **Conforms**
- v) Three point linkage hitch as per IS: 4468 (Part:1): 1997(Reaffirmed 2012) : **Partially conform**
- vi) Dimensions of PIC yoke as per IS: 4931:1995 (Reaffirmed 2009) : **Partially conform**

17. COMMENTS AND RECOMMENDATIONS

- 17.1 The three point linkage, and PIC yoke bore dimensions do not meet the requirement of Indian Standard. It **MUST** be improved.
- 17.2 The discharge rate for fine cone spray pattern and jet spray pattern of spray gun at the pressure of 600 kPa does not conform the requirement of IS: 3652: 1995. It **MUST** be looked into for appropriate improvement.
- 17.3 The spray angle for fine cone spray pattern of spray nozzle at the pressure of 600 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked into.
- 17.4 Safety guard on P.T.O. drive shaft and belt pulley is not provided. It **MUST** be looked into.
- 17.5 The strainer in nozzle is not provided. It may be considered for providing.
- 17.6 The spray angle for fine cone spray pattern of spray nozzle at the pressure of 300 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked for further improvement.
- 17.7 The provision against overload on P.T.O drive shaft is not provided. It **MUST** be looked into.
- 17.8 The necessary tools are not provided. It **MUST** be provided.
- 17.9 The tank indicating levels & level graduations are not provided. It **MUST** be provided.
- 17.10 The strainer at filling hole is not provided. It **MUST** be provided.

- 17.11 The manufacture's name or recognized trade mark, batch or code number and designation of nozzle is not marked. It **MUST** be looked into.
- 17.12 The batch or code number and designation of gun is not marked. It **MUST** be looked into.
- 17.13 The suitable drain plug at the bottom of the tank for cleaning is not provided. It **MUST** be looked be into.
- 17.14 The make & model of pump is not specified. It **MUST** be looked into.
- 17.15 The safety wear are not provided. It **MUST** be provided.
- 17.16 **Safety provision/safety wear**
Safety instructions regarding handling poisonous agro chemical before, during and after spraying operations should be provided on sprayer


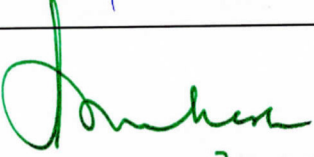
18. TECHNICAL LITERATURE

The following literatures are 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	 30.05.2022

The draft test report compiled by Abhishek Chourey, MTS (Technical)

19. APPLICANT'S COMMENTS

We will work on the recommendations given by nrfmtti and will make our product a world class product.