

THIS TEST REPORT VALID UP TO : 30th June, 2029



**VISHWAKARMA, VETM-200
TRACTOR OPERATED BOOM 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: fmti-nr@nic.in

Tele./FAX: 01662-276984

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. over flow (ml/min)	Average discharge from the discharge line (ml/min)	Discharge rate of pump (ml/min)	Hydraulic power (kW)
788	25.0	1	44000	NIL	NIL	44387.5	44387.5	1.8
		2	44800	NIL				
		3	44100	NIL				
		4	44650	NIL				
782	26.5	1	42750	NIL	NIL	42730.0	42730.0	1.9
		2	42650	NIL				
		3	42820	NIL				
		4	42700	NIL				
780	28.0	1	41700	NIL	NIL	41635.0	41635.0	1.9
		2	41680	NIL				
		3	41560	NIL				
		4	41600	NIL				
778	30.0	1	41200	NIL	Nil	41125.0	41125.0	2.0
		2	40850	NIL				
		3	41300	NIL				
		4	41150	NIL				

Minimum discharge rate : **41125.0 ml/min at 30 kg/cm²**
Maximum discharge rate : **44387.5 ml/min at 25 kg/cm²**
Discharge at Rated pressure : **44387.5 ml/min at 25 kg/cm²**

6 TEST FOR VOLUMETRIC EFFICIENCY OF PUMP
(Vide clause 8.4 of IS:11313-2007)

Date of Test : 10.06.2022
 Rated pressure, kg/cm² : 25
 Rated speed of pump, rpm : 800
 Theoretical Volume, ml : 59.35
 Actual volume at rated speed & rated pressure, ml : 55.48
 Volumetric efficiency, % : 93.48

7. PRESSURE ADJUSTMENT TEST
(Vide Clause 8.7.1 of IS: 11313-2007)

1. Date of test : 10.06.2022
2. Atmospheric conditions
 - a. Temperature : 43.3 °C
 - b. Relative humidity : 18.0 %
 - c. Pressure : 99.2 kPa

3. Data recorded

S. No.	Working pressure (kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	25.0	NIL	NIL	--
2.	26.5	NIL	NIL	--
3.	28.0	NIL	NIL	--
4.	30.0	NIL	NIL	--

4. Resistance to different pressure: Yes

8. TEST FOR NOZZLE

[vide Clause 5.15 of IS:11313-2007 & Annex F of IS: 3652-1995]

Date of test : 09.06.2022

Type of nozzle (apa) : Fixed, Hollow cone

8.1 TEST FOR DISCHARGE RATE OF NOZZLE

The discharge rate for fine cone spray as 817 ml/min at a pressure of 300 kPa was declared by the applicant. However, the discharge rate corresponding to 300 kPa was observed as 1238.33 ml/min for fine cone spray pattern.

Remarks :- Discharge rate for fine cone spray is not within the limit specified by the relevant code/standard.

8.2 TEST FOR SPRAY ANGLE OF NOZZLE

The spray angle for fine cone spray pattern at the pressure of 300 kPa was 75 degree, as declared by the applicant. However, the spray angle corresponding to 300 kPa pressure was observed as 73.2 degree.

8.3 ENDURANCE TEST OF NOZZLE

1. Date of test : 01.06.2022 to 09.06.2022
2. Total running hours : 48
3. Quantity of liquid collected and spray angle observed during endurance test.

Sr. No.	No. of Collection	Avg. discharge, ml/min. (Fine cone spray pattern)	Spray angle, degree.
a)	First collection	15150.0	72.6
b)	Second collection	14807.5	73.9
c)	Third collection	14752.5	73.2
d)	Fourth collection	14815.0	72.2
e)	Fifth collection	15167.5	74.6
f)	Sixth collection	15190.0	73.9
g)	Seventh collection	14832.5	73.2
h)	Eight collection	15200.0	73.9

Remark:

- i) Percentage variation of discharge at fine cone spray pattern from first to last collection is 0.33%
- ii) The variation in spray angle of nozzle at fine cone spray pattern from first to last collection is 1.3 degree.

8.4 SPRAY DISTRIBUTION PATTERN OF NOZZLE

The liquid discharge from nozzle at 300 kPa pressure was collected in glass tube of patternator. The spray pattern as per the quantity of liquid collected is represented in tabular form in Fig. 5.

8.5 NOZZLE DESIGNATION : Not Specified

Provision of strainer in nozzle : Provided

8.6 MARKING

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

Batch or code number : **Not marked**

9. AIR PRESSURE CHAMBER TEST

[vide Clause 8.7.2 of IS:11313-2007]

9.1

Date of test : 10.06.2022		
Sr. No	Details	Condition
1.	Hydraulic pressure	62.5 kg/cm ²
2.	Duration of pressure application	30 second
3.	Result	No leakage or deformation of pressure chamber was found during the test

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Cl.10. MARKING AND PACKING (Cl.10 IS:11313-2007)			
Cl.10.1 Marking	Each sprayer shall be marked with the following particulars :-		
a)	Manufacturer's name & his registered trade mark,	Vishwakarma Engineering Head office: At & Po. Vagra-392140 Distt. Bharuch (Gujarat) India	Conforms
b)	Sr. No. and batch or code No.	22 B 2001	

14. CRITICAL TECHNICAL SPECIFICATIONS

[Vide Ministry letter No.13-9/2019- M&T (I&P) part dated. 26.04.2019 and F.No. 9-4/2019 M&T (I&P) dated 20.8.2019]

Sr. No.	Parameters	Specification	Observation	Remarks
1	Tank capacity	Should not be less than 100 Lit.	Capacity of tank is 200 lit	Conforms
2	Provision for folding boom	Must be provided	Provided	Conforms
3	Pressure regulator	Must be provided	Provided	Conforms
4	Pressure gauge with pressure dampener	Liquid filled pressure gauge must be provided	Liquid filled pressure gauge is provided	Conforms
5	Discharge rate, ml/min	Min 8000, at rated speed and rated pressure	The discharge rate at rated speed & rated pressure is 44387.5 ml/min	Conforms
6	Strainer at filling hole	Must be provided	Provided	Conforms
7	Spray gun designation and marking	Designation, manufacturers name or recognized trade mark & batch or code number should be marked	Not applicable, as it is tractor operated boom sprayer.	--
8	Length of spray boom, m	6 (Min.)	Length of spray boom is 9.110 m	Conforms
9	Nozzle designation and marking	Designation, manufacturers name or recognized trade mark & batch or code number should be marked	Marked as Aspee	Partially Conform
10	P.T.O. drive shaft -Safety against overload -Guard on shaft	Must be provided Must be provided	Not Provided Not provided	Does not conform
11	Guard on belt pulley drive	Must be provided	Not Provided	Does not Conform
12	Safety wear	Mask, hand gloves, gum boots and goggles, aprons must be provided	Provided	Conforms

13	Labeling plate sprayer	Metallic labeling plate should be riveted with following information manufactures name, make, model, serial number, month, & year of manufacture, rated speed, rated pressure and recommended tractors horse power	Provided	Conforms
14	Literature	Operator manual, service manual & parts catalogue should be provided	Operator manual, parts catalogue & service manual are provided	Conforms

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

15. 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 & PIC yoke as per IS: 4931:1995 (Reaffirmed 2009)	:	Partially conform

16. COMMENTS AND RECOMMENDATIONS

- 16.1** The three point linkage and PIC yoke bore dimensions do not meet the requirement of Indian Standard. It **MUST** be improved.
- 16.2** The discharge rate for fine cone spray pattern of nozzle at a pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 16.3** Safety guard on P.T.O drive shaft and belt pulley are not provided. It **MUST** be looked into.
- 16.4** The safety against overload P.T.O drive shaft is not provided. It **MUST** be looked into.
- 16.5** The engaged threaded length of outlet port does not meet the requirement of relevant code/Standards in toto, it **MUST** be looked into
- 16.6** The spray nozzle is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard needs to provided.
- 16.7** The necessary tools are not provided. It **MUST** be provided.
- 16.8** The tank indicating level & level graduations are not provided. It **MUST** be provided.

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- 16.9 The pressure gauge with fuel scale reading of 120 bar is provided. Thus it does not conform the requirement of IS:11313:2007. It **MUST** be looked into
- 16.10 The average aperture size of suction filter does not meet the requirement of Indian Standard. It **MUST** be looked into
- 16.11 **Safety provision/safety wear**
- i) Safety instructions regarding handling poisonous agro-chemical before, during and after spraying operation should be provided on sprayer.


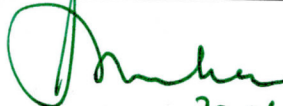
17. TECHNICAL LITERATURE

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 sprayers should be updated as per IS:8132-1999.

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 30.06.2022

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

18. APPLICANT'S COMMENTS

Para No.	Reference No.	Applicant's comments
16	16.1 to 16.11	With immediate effects, we will inform to our information production department to take care the Corrective action before dispatching material from the factory to sales unit.

