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व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS - 418/2359/2019

माह/Month: September, 2019

THIS TEST REPORT VALID UP TO : 30st SEPTEMBER, 2026



ADHYA SHAKTI ASEW-500
TRACTOR OPERATED HTP SPRAYER



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation 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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ix)	Pressure regulators	Brass, stainless steel	Stainless Steel	Conforms
x)	Suction strainer	Brass, stainless steel, plastics	Stainless steel	Conforms
xi)	Strainer body	Brass, plastics	Plastic	Conforms
xii)	Gasket	Rubber, PVC, Leather, fiber	PVC	Conforms
xiii)	Spray nozzles	Brass, stainless steel	Brass	Conforms
xiv)	Spray boom	Mild steel, Galvanized, iron Braided rubber	N.A.	--
xv)	Hose	Synthetic rubber, P.V.C	PVC	Conforms
xvi)	Tank	Galvanized iron, Brass, Fiber glass reinforced plastics.	Plastics	Conforms
xvii)	Pipe for agitator	Galvanized iron, Brass, PVC	PVC	Conforms
xviii)	Piston (bucket) screw	Brass, stainless steel	NA	--
xix)	Crank case	Aluminum alloy	Aluminum alloy	Conforms
xx)	Roller pump body	Nickel resistant cast iron	N.A.	---
xxi)	Roller pump and plate	Nickel resistant cast iron	N.A.	---
xxii)	Roller pump rotor	Nickel resistant cast iron	N.A.	---
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	N.A.	---
xxvi)	Connecting rod	Carbon steel	Aluminum alloy	Does not conform
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	Not provided	--
xxx)	The material used for different components shall be declared by the manufacturer all the components mentioned in the table-I may not be present in a particular sprayer.		Declared	Conforms

3. TEST FOR DISCHARGE RATE OF PUMP

[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 31.07.2019
2. Atmospheric conditions :
 - a) Temperature : 36°C
 - b) Relative humidity : 62%
 - c) Pressure : 97.7 kPa

3. Data recorded

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)	Hydraulic power (Kw)
803	10	1	9300	31977.5	9217.5	41195.0	1.18
		2	9200				
		3	9260				
		4	9110				
799	15	1	11250	29625.0	11300.0	40925.0	1.74
		2	11400				
		3	11300				
		4	11250				
795	20	1	13100	27225.0	13085.0	40310.0	2.05
		2	13120				
		3	13000				
		4	13120				
792	25	1	14200	25640.0	14065.0	39705.0	2.44
		2	14000				
		3	14060				
		4	14000				

Minimum discharge rate = 39705.0 ml/min at 25 kg/cm²
 Maximum discharge rate = 41195.0 ml/min at 10 kg/cm²
 Discharge at Rated pressure = 40925.0 ml/min at 15 kg/cm²

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

Rated pressure, kg/cm² : 15
 Rated rpm of pump : 799
 Theoretical Volume, ml : 53.01
 Actual volume at rated rpm & rated pressure, ml : 51.22
 Volumetric efficiency % : 97 %

5. POWER REQUIREMENT

(Vide Clause 6.3 of IS – 11313 : 2007)

The pump power requirement of the sprayer has been given as 3 to 5 hp (2.24 to 3.68 kW).

The test for power required for operating the sprayer was conducted as per clause 8.5 of IS: 11313-2007 and data recorded is reported herewith.

Test No.	Pressure (kg/cm ²)	Dynamometer reading		Pump speed (rpm)	Required power (kW)	Discharge (litre/min)
		Speed (rpm)	Torque (Nm)			
1	10	534	20.83	803	1.18	41.20
2	15	531	36.16	799	1.74	40.93
3	20	530	36.66	795	2.05	40.31
4	25	529	43.66	792	2.44	39.71

- Remark:**
- The power requirement was observed from 1.18 to 2.44 kW throughout the range of pressure against the declaration of 3 to 5 hp (2.24 to 3.68 kW)
 - At rated speed and pressure of pump the power requirement is observed as 1.74 kW.

6. PRESSURE ADJUSTMENT TEST

(Vide Clause 8.7.1 of IS: 11313-2007)

- Date of test : 31.07.2019
- Atmospheric conditions :
 - Temperature : 36 °C
 - Relative humidity : 62%
 - Pressure : 97.7 kPa
- Data recorded

S. No.	Working pressure(kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	10	NIL	NIL	--
2.	15	NIL	NIL	--
3.	20	NIL	NIL	--
4.	25	NIL	NIL	--

- Resistance of pressure: Yes

7. TEST FOR HYDRAULIC SPRAY GUN

[Vide Clause 7.3(b) of IS- 11313: 2007 & Annex E of IS- 3652; 1995]

- Date of test : 03.06.2019
Type of gun : Screw type

7.1 TEST FOR DISCHARGE RATE OF SPRAY GUN

The discharge rate for fine cone spray & jet spray pattern as 4100 ml/min & 9300 ml/min at the pressure of 600 kPa was declared by the applicant. The discharge rate corresponding to 600 kPa pressure was observed as under

- For fine cone spray pattern : 1907.5 ml/min
- For jet spray pattern : 3555.0 ml/min

17.	Literature	Operator manual, service manual & parts catalogue must be provided in English, Hindi, Local languages.	Operator's manual cum part's catalogue of pump & sprayer is provided	Does not conform in toto
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15. CONFORMITY TO INDIAN STANDARDS

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

16. COMMENTS AND RECOMMENDATIONS

- 16.1 The material of connecting rod and pump inlet port end fitting does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.2 The three point linkage and power input connection dimensions does not meet the requirement of Indian Standard. It **MUST** be improved.
- 16.3 The discharge rate for fine cone spray pattern and jet spray pattern spray gun at the pressure of 600 kPa does not conform the requirement of IS: 3652: 1955. It **MUST** be looked into for appropriate improvement
- 16.4 Provision against overload on P.T.O. drive shaft is not provided, It **MUST** be looked into.
- 16.5 Safety guard on P.T.O. drive shaft is not provided. It **MUST** be looked into.
- 16.6 The spray gun provided with sprayer is not designated as specified by relevant Indian Standard. It should be designated.
- 16.7 The necessary tools are not provided. It **MUST** be provided.
- 16.8 A suitable pressure gauge/pressure indicator needs to be provided on sprayer as per the specifications specified by Indian Standard.
- 16.9 The discharge rate for fine cone spray and jet 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.
- 16.10 The spray nozzle is not designated as specified by relevant Indian Standard. It should be designated.
- 16.11 The diameter of connecting rod does not meet the requirement of relevant code/standard. It **MUST** be looked into.
- 16.12 The gun batch or code number is not marked on spray gun. It **MUST** be marked.
- 16.13 The guard on belt pulley drive of sprayer is not provided. It **MUST** be provided.
- 16.14 The spray nozzle batch or code number is not marked on spray nozzle. It **MUST** be marked.
- 16.15 The engaged threaded length of outlet port does not meet the requirement of relevant Indian Standard. It **MUST** be looked into.

- 16.16** A suitable labeling plate needs to be provided with, inter alia, following information;-
- Manufacturer's name
 - Make
 - Model
 - Month & year of manufacture
 - Rated speed
 - Rated pressure
 - Discharge rate
 - Recommended tractor horse power

16.17 Safety provision/safety wear

- Apron and gum boots **MUST** be added in safety wear.
- Safety instructions regarding handling poisonous agro chemical before, during and after spraying operations should be provided on sprayer

17. TECHNICAL LITERATURE

The following literatures are provided with the sprayer.

- Operator's manual of pump and sprayer with part's catalogue.

The following literature **MUST** be provided with the sprayer.

- Service manual of sprayer.

The operator's manual of sprayer needs to be update as per IS:8132-1999

TESTING AUTHORITY

R.K. NEMA SENIOR AGRICULTURAL ENGINEER	<i>Re</i>
P. K.PANDEY DIRECTOR	<i>U301-JWSH</i>

18. APPLICANT'S COMMENTS

We will be fulfilling all the recommendations.

