व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

संख्या/ **No.: PS-518/2889/2022**

माह/**Month: August, 2022**

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

RICOITALY, GRI-26 (ITALIA)
ENGINE OPERATED HTP 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]

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Tele./FAX: 01662-276984

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 No.-1 of IS:11313-2007 may not be present in a particular sprayer.		Declared by the manufacturer	--

4. RUNNING-IN

The HTP sprayer was run-in for 1 hour as recommended by the applicant before starting of test.

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

1. Date of test : 05.07.2022
2. Atmospheric conditions
   a) Temperature : 35.7 °C
   b) Relative humidity : 64.3 %
   c) Pressure : 97.4 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)	Average overflow (ml/min)	Average delivery from the discharge line (ml/min)	Discharge rate of pump (ml/min)	Hydraulic Power (kW)
877	25.0	1	14500	NIL	NIL	14582.5	14582.5	0.6
		2	14480	NIL				
		3	14650	NIL				
		4	14700	NIL				
874	28.0	1	13900	NIL	NIL	13987.5	13987.5	0.6
		2	14000	NIL				
		3	14100	NIL				
		4	13950	NIL				
872	31.0	1	13800	NIL	NIL	13832.5	13832.5	0.7
		2	13850	NIL				
		3	13780	NIL				
		4	13900	NIL				
868	35.0	1	13780	NIL	NIL	13782.5	13782.5	0.8
		2	13800	NIL				
		3	13700	NIL				
		4	13850	NIL				

Minimum discharge rate = 13782.5 ml/min at 35 kg/cm^2
Maximum discharge rate = 14582.5 ml/min at 25 kg/cm^2
Discharge at rated pressure = 14582.5 ml/min at 25 kg/cm^2

6. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP
[vide clause 8.4 of IS: 11313-2007]

Date of test : 06.07.2022
Rated pressure, kg/cm^2 : 25
Rated RPM of pump : 900
Theoretical volume, ml : 18.24
Actual volume at rated rpm & rated pressure, ml : 16.20
Volumetric efficiency, % : 88.81

7. POWER REQUIREMENT
During the pump operation from minimum to maximum pressure range, the max. hydraulic power was observed as 0.80 kW against the declared net power output of engine as 2.96 kW.

8. ENGINE RATING TEST AND FUEL CONSUMPTION TEST

Date of test : 26.07.2022
Type of dynamometer : Eddy current
Model of dynamometer : Electrodyne AG-10
Dynamometer constant : 9549.305

Sr. No	Hours of the day	Load (%)	Load (Nm)	Engine Speed (rpm)	Power (kW)	Fuel consumption			Specific energy (kWh/l)
						kg/h	l/h	Specific g/kWh	
1.	9.40	Test started							
2.	10.40	100	7.77	3600	2.93	1.204	1.593	410.90	1.839
3.	11.42	100	7.70	3599	2.90	1.201	1.589	414.24	1.825
4.	12.40	100	7.58	3598	2.85	1.187	1.570	416.33	1.815
5.	13.40	100	7.53	3599	2.84	1.182	1.563	416.06	1.817
6.	14.40	100	7.53	3598	2.84	1.167	1.543	410.76	1.841
7.	15.40	100	7.57	3598	2.85	1.154	1.527	405.02	1.866
8.	16.40	100	7.53	3600	2.83	1.159	1.533	409.52	1.846
9.	17.10	100	7.60	3599	2.87	1.152	2.524	401.43	1.883
Avg.		**100**	**7.60**	**3599**	**2.86**	**1.176**	**1.555**	**410.53**	**1.842**
10	17.40	Loaded to 110% load							
		110	8.35	3550	3.10	1.217	1.610	392.73	1.925
11.	17.50	Loaded to 75% load							
		75	5.70	3687	2.20	1.010	1.335	458.86	1.648
12.	18.00	Loaded to 50 % load							
		50	3.82	3700	1.48	0.800	1.058	540.44	1.399
13.	18.10	Loaded to 25 % load							
		25	1.89	3731	0.75	0.661	0.874	888.73	0.858
14.	18.20	Unloaded							
		Unloaded	0.24	3796	0.10	0.520	0.688	5203.50	0.145

20. 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	Observed	Remarks
1.	Tank Capacity	--	Not applicable for portable sprayer	--
2.	Discharge, ml/min	8000 (min) at rated speed and rated pressure	The discharge rate at rated pressure is 14582.5 ml/min.	Conforms
3.	Pressure regulator	Must be provided	Provided	Conforms
4.	Horizontal thrown up jet spray, m	6 (min)	7.8 meter	Conforms
5.	Mass of spray gun, kg	1.6 (max.)	0.220 kg	Conforms
6.	Spray gun marking	Manufacturer name or recognized trademark & batch or code number as per BIS code	**Not marked**	**Does not conform**
7.	Marking of nozzle	Manufacturer name or recognized trademark & batch or code number as per BIS code	**Not marked**	**Does not conform**
8.	Pressure gauge	Must be provided	Liquid filled pressure gauge is provided	Conforms
9.	Safety accessories	Mask, hand gloves and safety goggles, apron, gum boots must be provided	**Not provided**	**Does not conform**
10.	Necessary tools & spares	Spanners, set of gasket, measuring jar should be provided	A set of necessary tools are provided with pump kit, different size gaskets, pump spanner, spark plug spanner	**Partially conform**
11.	Making/labelling of sprayer	Must be riveted on the body of sprayer having name & address of manufacture, month & year of manufacture, rated speed, rated pressure, discharge rate, power rating of engine, SFC of engine	Just a sticker and not proper labeling plate is provided on the sprayer with following information:	**Partially conform**
12.	Literature	Operator manual, service manual & parts catalogue should be provided.	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

21. COMMENTS AND RECOMMENDATIONS

21.1 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.

21.2 The manufacturer's name or recognized trade mark, batch or code number and designation of gun is not marked. It **MUST** be looked into.

21.3 The discharge rate for fine cone spray pattern & 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.

21.4 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.

21.5 The strainer in nozzle is not provided. It **MUST** be looked into.

21.6 The spray nozzle is not designated by its identification mark as specified by Indian Standard. It **MUST** be Looked into.

21.7 The pressure gauge with full scale reading of 100 bar is provided. Thus, it does not conform the requirement of IS:11313-2007. It **MUST** be looked into.

21.8 The engaged length of outlet port of pump does not meet the requirement of relevant code/ standard. It **MUST** be looked into.

21.9 The necessary tools are not provided. It **MUST** be provided.

21.10 The safety wear is not provided. It **MUST** be provided.

21.11 A suitable labeling plate (not sticker) needs to be provided with "Interlia" following information.

(i) Manufacturer's name
(ii) Make
(iii) Model
(iv) Month & year of manufacturer
(v) Rated pressure
(vi) Rated speed
(vii) Discharge rate
(viii) Power rating of engine
(ix) SFC of engine

21.12 Safety provision/safety wear

i) Safety instructions regarding handling poisonous agro- chemical before, during and after spraying operation should be provided on sprayer.

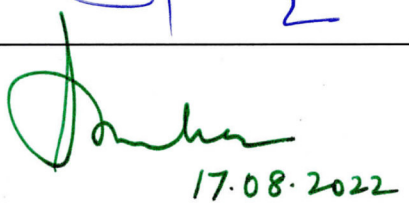
22. TECHNICAL LITERATURE

The following literatures are provided with sprayer for guidance to the user.

i) Operators manual
ii) Service manual
iii) Parts catalogue
iv) Engine user manual & part catalogue

However, the manuals of sprayer need to be updated as per IS:8132-1999

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN **DIRECTOR**	 17.08.2022

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

23. APPLICANT'S COMMENTS

No specific comments received from the applicant.