

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS-506/2839/2022

माह/Month: April, 2022

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



**CHARLIE, CH-400-B20
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]

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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)
886	36.0	1	37000	8520	8412.5	36962.5	45375.0	2.7
		2	36850	8380				
		3	36900	8400				
		4	37100	8350				
882	38.0	1	33700	10500	10647.5	33722.5	44370.0	2.8
		2	33800	10750				
		3	33650	10640				
		4	33740	10700				
875	39.0	1	28250	14400	14887.5	28475.0	43362.5	2.8
		2	28700	15000				
		3	28450	15300				
		4	28500	14850				
870	42.0	1	14100	28370	28505.0	14432.5	42937.5	2.9
		2	14800	28550				
		3	14550	28900				
		4	14280	28200				
865	45.0	1.	3200	38680	38707.5	3307.5	42015.0	3.1
		2.	3400	38800				
		3.	3250	38700				
		4.	3380	38650				

Minimum discharge rate : 42015.0 ml/min at 45 kg/cm²

Maximum discharge rate : 45375.0 ml/min at 36 kg/cm²

Discharge at rated pressure : 44370.0 ml/min at 38 kg/cm²

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

Date of Test : 05.04.2022
 Rated pressure, kg/cm² : 38
 Rated speed of pump, rpm : 900
 Theoretical Volume, ml : 51.69
 Actual volume at rated speed & rated pressure, ml : 49.30
 Volumetric efficiency, % : 95.38

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

1. Date of test : 05.04.2022
2. Atmospheric conditions :
 - a. Temperature : 36.7 °C
 - b. Relative humidity : 34.3 %
 - c. Pressure : 98.2 kPa

3. Data recorded

S. No.	Working pressure (kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	36.0	NIL	NIL	--
2.	38.0	NIL	NIL	--
3.	39.0	NIL	NIL	--
4.	42.0	NIL	NIL	--
5.	45.0	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 : 05.04.2022

Type of nozzle (apa) : Fixed, Flat fan

8.1 TEST FOR DISCHARGE RATE OF NOZZLE

The discharge rate for fine cone spray as 1190 ml/min at a pressure of 300 kPa was declared by the applicant. However, the discharge rate corresponding to 300 kPa was observed as 1291.04 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 110 degree, as declared by the applicant. However, the spray angle corresponding to 300 kPa pressure was observed as 92.6 degree.

Remarks : The spray angle for fine cone spray pattern at the pressure of 300 kPa is not within the limit specified by the relevant code/standard.

8.3 ENDURANCE TEST OF NOZZLE

- Date of test : 29.03.2022 to 05.04.2022
- Total running hours : 48
- 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	15442.5	92.1
b)	Second collection	15480.0	92.6
c)	Third collection	15452.5	91.6
d)	Fourth collection	15877.5	93.1
e)	Fifth collection	15542.5	92.1
f)	Sixth collection	15427.5	91.6
g)	Seventh collection	15675.0	92.6
h)	Eight collection	15702.5	93.1

Remark:

- Percentage variation of discharge at fine cone spray pattern from first to last collection is 1.68%**
- The variation in spray angle of nozzle at fine cone spray pattern from first to last collection is 1.0 degree.**

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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,	Charlie Agricultural Sprayers Made In India Jagatsukh Industries (LDH.-13)	Conforms
b)	Sl. No. and batch or code No.	JSI 02190322	

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 400 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 44370.0 ml/min	Conforms
6	Strainer at filling hole	Must be provided	Provided	
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.	Conforms
8	Length of spray boom, m	6 (Min.)	Length of spray boom is 6.020 m	Conforms
9	Nozzle designation and marking	Designation, manufacturers name or recognized trade mark & batch or code number should be marked	Marked	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

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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, power input connection 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** 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.
- 16.4** Safety guard on P.T.O drive shaft and belt pulley are not provided. It **MUST** be looked into.
- 16.5** The safety against overload P.T.O drive shaft is not provided. It **MUST** be looked into.
- 16.6** The engaged threaded length of outlet port does not meet the requirement of relevant code/Standards in toto, it **MUST** be looked into

16.7 The spray nozzle designation is not marked. It **MUST** be looked into.

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

16.9 The tank indicating level is not provided. It **MUST** be provided.

16.10 Safety provision/safety wear

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

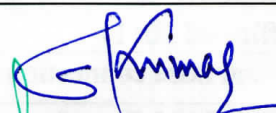

17. TECHNICAL LITERATURE

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	 08.04.2022

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

18. APPLICANT'S COMMENTS

As per the recommendation by authority we accept the same and from now we will improve in our production.