

व्यावसायिक परीक्षण रिपोर्ट

संख्या/ No.: PS-477/2687/2021

COMMERCIAL TEST REPORT (FIRST BATCH)

माह/Month : March, 2021

THIS TEST REPORT VALID UP TO : 31st March, 2026



**CHARLIE, CH-600-A
TRACTOR OPERATED SPRAYER
(FIRST BATCH)**



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

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: fnti-nr@nic.in

Tele./FAX: 01662-276984

4. RUNNING-IN

Applicant has not recommend running-in of sprayer

5. TEST FOR DISCHARGE RATE OF PUMP

[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 26.02.2021
 2. Atmospheric conditions :
 a) Temperature : 26.5°C
 b) Relative humidity : 47.1%
 c) Pressure : 98.3 kPa

3. Data recorded

Avg. Speed of Pump (rpm)	Working pressure (kg/cm ²)	Test No.	Delivery from the discharge line (ml/min)	Avg. Overflow (ml/min)	Average discharge from the discharge line (ml/min)	Discharge rate of pump (ml/min)	Hydraulic power (Kw)
763	36.0	1	22180	38232.5	22155.0	60387.5	3.6
		2	22200				
		3	22100				
		4	22140				
764	38.0	1	22450	37795.0	22355.0	60150.0	3.8
		2	22320				
		3	22250				
		4	22400				
762	40.0	1	23100	36670.0	23225.0	59895.0	4.0
		2	23600				
		3	23200				
		4	23000				
761	42.0	1	24390	35390.0	24397.5	59787.5	4.2
		2	24410				
		3	24350				
		4	24440				

Minimum discharge rate = 59787.5 ml/min at 42 kg/cm²
 Maximum discharge rate = 60387.5 ml/min at 36 kg/cm²
 Discharge at Rated pressure = 59895.0 ml/min at 40 kg/cm²



6. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP

[Vide clause 8.4 of IS-11313 : 2007]

Date of test	:	03.03.2021
Rated pressure, kg/cm ²	:	40
Rated rpm of pump	:	762
Theoretical Volume, ml	:	64312.80
Actual volume at rated rpm & rated pressure, ml	:	59590.00
Volumetric efficiency %	:	92.7

7. PRESSURE ADJUSTMENT TEST

[Vide Clause 8.7.1 of IS: 11313-2007]

1. Date of test : 26.02.2021
2. Atmospheric conditions :
 - a. Temperature : 26.5 °C
 - b. Relative humidity : 47.1%
 - c. Pressure : 98.3 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.	40.0	NIL	NIL	--
4.	42.0	NIL	NIL	--

4. Resistance of 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	:	25.02.2021
Type of gun	:	Screw type

8.1 TEST FOR DISCHARGE RATE OF SPRAY GUN

The discharge rate for fine cone spray & jet spray pattern as 10000 ml/min & 11500 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 : 6352.5 ml/min
- For jet spray pattern : 9312.5 ml/min

Remarks :- Discharge rate for fine cone spray pattern and jet spray pattern was observed 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 80.3 degree.

Remarks :- The spray angle for fine cone spray pattern at the pressure of 600 kPa was observed 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 Minute
4	Result	No leak, crack or burst of gun was observed during test

8.4 SPRAY GUN DESIGNATION : Not marked

8.5 MARKING

Manufacturer's name or recognized trade mark : Not marked

Batch or code number : Not marked

8.6 ENDURANCE TEST OF GUN

i) Date : 20.02.2021 to 24.02.2021

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	6295.0	9215.0	79.1
b)	Second collection	6275.0	9137.5	79.7
c)	Third collection	6247.5	9242.5	80.9
d)	Fourth collection	6407.5	9240.0	80.3
e)	Fifth collection	6360.0	9277.5	78.5
f)	Sixth collection	6335.0	9272.5	80.6
g)	Seventh collection	6355.0	9275.0	78.8
h)	Eighth collection	6342.5	9267.5	79.7

Remarks : (1) Percentage variation of discharge rate at fine cone spray pattern from first to last collection, 0.75%.

(2) Percentage variation of discharge rate at jet spray pattern from first to last collection, 0.57%.

(3) Percentage variation in spray angle of gun at cone spray pattern, 0.76%.

9. TEST FOR NOZZLE

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

Date of test : 25.02.2021
 Type of nozzle (apa) : Hollow cone

9.1 TEST FOR DISCHARGE RATE OF NOZZLE

The discharge rate for fine cone spray & jet spray pattern as 7000 ml/min & 8000 ml/min at a pressure of 300 kPa was declared by the applicant. The discharge rate corresponding to 300 kPa pressure was observed as under :-

-For fine cone spray pattern : 5915.0 ml/min
 - For jet spray pattern : 8712.5 ml/min

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

9.2 TEST FOR SPRAY ANGLE OF NOZZLE

The spray angle for fine cone spray pattern at the pressure of 300 kPa was 60 degree declared by the applicant. However, the spray angle corresponding to 300 kPa pressure was observed as 73.2 degree.

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

9.3 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 and in Fig. 5.

9.4 NOZZLE DESIGNATION : Not marked
 Provision of strainer in nozzle : Not provided

9.5 MARKING
 Manufacturer's name or : Not marked
 recognized trade mark
 Batch or code number : Marked as D6



16. CONFORMITY TO INDIAN STANDARDS

- i) IS:11313-2007 (Reaffirmed 2012)-Hydraulic power sprayer-specification : **Does not conform in toto**
- ii) Spray nozzle and spray gun as per IS:3652-1995 (Reaffirmed 2011) : **Does not conform in toto**
- 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) : **Does not conform in toto**
- vi) Dimensions of PIC yoke as per IS: 4931:1995 (Reaffirmed 2009) : **Does not conform in toto**

17. COMMENTS AND RECOMMENDATIONS

- 17.1 The three point linkage, power input connection and PIC yoke bore dimensions does 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 Safety guard on P.T.O. drive shaft is not provided. It **MUST** be looked into.
- 17.4 The manufacturer's name or recognized trade mark, batch or code number and designation of gun is not marked. It **MUST** be looked into.
- 17.5 The strainer in nozzle is not provided. It may be considered for providing.
- 17.6 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.
- 17.7 The spray angle for fine cone spray pattern of spray gun at the pressure of 600±60 kPa does not conform to the requirement of IS : 3652-1995. It **MUST** be looked for further improvement.
- 17.8 The Manufacturer name or recognized trade mark and designation is not marked on spray nozzle. It **MUST** be marked.
- 17.9 The spray angle for fine cone spray pattern of spray nozzle at the pressure of 300±30 kPa does not conform to the requirement of IS : 3652-1995. It **MUST** be looked for further improvement.
- 17.10 The pressure gauge with full scale reading of 120 kg/cm² is provided, thus it does not conform to requirement of IS:11313-2007. It **MUST** be looked into.
- 17.11 The power requirement of pump does not meet the requirement of IS: 11313-2007. It **MUST** be looked into.



- 17.12 The year of manufacturer of sprayer is given as '1996' in both specification sheet as well as labeling plate. This does not seem corrected. Necessary action may be taken.
- 17.13 **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) Part's Catalogue

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

19. COMPARISON WITH SPECIFICATION OF PREVIOUS SAMPLE

(Test report No. PS- 139/1671/2014, November, 2014) of NRFMT&TI, Hisar and PRESENT SAMPLE

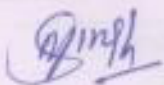
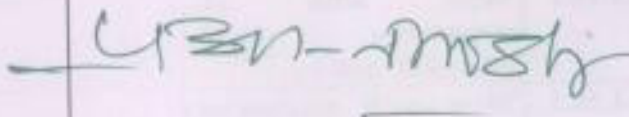
SI No.	Parameter		Previous Sample (As per test report No. PS-139/1671/2014, November, 2014)	Present Sample
1	2		3	4
19.1	Specifications			
19.1.1	General			
	Type	:	Hydraulic Power sprayer Pump	Tractor operated sprayer mounted type.
	Make (apa)	:	Charlie	Charlie
	Model (apa)	:	CH-600-A	CH-600-A
	Brand	:	Not Specified	Charlie
	Serial No.	:	CH-600-A GUN JET	JSI-1526112020
	Output capacity, l/min	:	47 to 70	47 to 70
	Name of manufacturer(apa)	:	Jagatsukh Industries 1339/6, Passi Chowk, Pakhowal Road, Ludhiana-141013, Punjab	
	Year of manufacture	:	1996	1996
	Recommended tractor power kW (apa)	:	Not Specified	22



PS-477/2687/2021	CHARLIE, CH-600-A TRACTOR OPERATED SPRAYER, COMMERCIAL (FIRST BATCH)
------------------	---

SI No.	Parameter	Previous Sample (As per test report No. PS-139/1671/2014, November, 2014)	Present Sample
1	2	3	4
19.2.2	Present Sample		
	Make	:	Charlie
	Model	:	CH-600-A
	Brand	:	Charlie
	Sr. no.	:	JSI-1526112020
	Output capacity, l/min	:	47-70
	Name of manufacturer	:	M/s Jagatsukh Industries 1339/6, Passi Chowk, Pakhowal Road, Ludhiana-141013, Punjab
	Year of manufacturer	:	1996
	Rated pressure	:	40 bar
	Rated speed	:	800 rpm
	Discharge rated	:	59 L/min

TESTING AUTHORITY

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY DIRECTOR	

20. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
20.1	17.1	We will maintain in future as per Indian Standard
20.2	17.2	We will maintain
20.3	17.4, 17.6 & 17.9	Will be provided in future
20.4	17.5	We will mark in future.
20.5	17.7	Will be maintain in future as per Indian Standard.
20.6	17.8	We will improve
20.7	17.10	We will improve pump quality
20.8	17.11	Will be maintain in future as per Indian Standard.