

प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट  
INITIAL COMMERCIAL TEST REPORT

संख्या/No. CSIR/CMERI/FMTTC/2024/051  
माह/Month: September 2024

THIS TEST REPORT VALID UP TO

:

31<sup>st</sup> AUGUST, 2031



**BALWAAN HTP POWER SPRAYER  
(MODEL: BHE 22)**



सत्यमेव जयते  
Government Of India



कृषि मशीनरी प्रशिक्षण और परीक्षण केंद्र  
**Farm Machinery Training and Testing Centre**  
सीएसआईआर- केन्द्रीय यांत्रिक अभियांत्रिकी अनुसंधान संस्थान  
**CSIR - Central Mechanical Engineering Research Institute**

महात्मा गांधी एवेन्यू, दुर्गापुर  
**Mahatma Gandhi Avenue, Durgapur**  
पश्चिम बंगाल - 713209  
**West Bengal - 713209**  
Website: <https://cmeri.res.in>

**E-mail:** [fmttc.cmeri@gmail.com](mailto:fmttc.cmeri@gmail.com)

Telephone: 9434592007 / 7001361295  
Fax: +91-343-2546745

CSIR/CMERI/FMTTC/2024/051	<b>BALWAAN (BHE 22)</b> <b>HTP POWER SPRAYER</b> <b>(INITIAL COMMERCIAL TEST)</b>
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## 2 TEST CODE/ PROCEDURE

IS: 11313 – 2007 (Reaffirmed 2012)	:	Hydraulic Power Sprayers – Specification.
IS: 3652 – 1995	:	Crop Protection equipment – Foot Sprayer – specification.
IS: 4905 – 1968	:	Method for random sampling.
IS: 2 – 1960	:	Rules for rounding off numerical values
Office Order No. 13 – 1/2019 – M & T (I & P) dated 17.06.2019		
Minutes of Meeting vide 13 – 1/2018 – M 7 T (I & P) dated NIL F. NO. 9 – 1/2018 – M & T (I&P) dated 20 <sup>th</sup> August, 2019		

## 3 SPECIFICATIONS

### 3.1 General

Type of machine	:	HTP Hydraulic Power Sprayer Pump
Make	:	Balwaan Krishi
Model	:	BHE 22
Brand	:	BALWAAN KRISHI
Serial No.	:	Not specified
Output Capacity, l/min	:	3.5 – 4.5
Name and address of manufacturer	:	Modish Tractor Aur Kisan Pvt. Ltd. 17-C Sharma Colony Ext. 22 Godam, Jaipur, (Rajasthan)
Year of manufacture	:	2024
Country of origin	:	India

**3.2 Recommended Source of Power:** Petrol Engine

### 3.3 Details of prime mover

Name and address of manufacturer	:	Modish Tractor Aur Kisan Pvt. Ltd. 17-C Sharma Colony Ext. 22 Godam, Jaipur, (Rajasthan)
Type	:	Air Cooled, 4 stroke, Overhead Valve (OHV), Single Cylinder, Horizontal Shaft, Petrol Engine
Make	:	Balwaan Krishi
Model	:	212 CC
Sr. No.	:	Not specified
Country of origin	:	India
Year of manufacture	:	2024
Engine speed (Manufacturer's recommended setting), (rpm)	:	<b>Report prepared by</b>

*Subrata kr Mandal*

**Report verified by**  
*Subrata kr Mandal*

**6 RUNNING – IN**

As per the applicant's request, the sprayer was operated for one hour before having any test.

**7 TEST FOR DISCHARGE RATE OF PUMP**

(Vide Clause 8.3 of IS: 11313 – 2007)

1. Date of Test : 03.09.2024
2. Atmospheric Conditions :
  - a. Temperature : 30 °C
  - b. Relative Humidity : 75%
  - c. Pressure : 1000 mBar
3. Data Recorded :

Speed of Engine (RPM)	Speed of Pump (RPM)	Working pressure (kg/cm <sup>2</sup> )	Test No.	Delivery from the discharge line (L/min)	Delivery from the Bypass line (L/min)	Average Pump discharge (L/min)	Hydraulic Power, kW
3850	1074	15	1	4.10	13.90	17.925	0.26
			2	4.15	13.75		
			3	4.20	13.65		
			4	4.25	13.70		
3820	1059	20	1	4.35	14.70	18.975	0.37
			2	4.20	14.75		
			3	4.25	14.65		
			4	4.30	14.70		
3790	1042	25	1	4.85	13.10	17.988	0.44
			2	4.75	13.20		
			3	4.90	13.15		
			4	4.75	13.25		
3780	1024	30	1	5.50	13.10	19.04	0.56
			2	5.90	13.40		
			3	5.85	13.25		
			4	5.75	13.40		

Minimum discharge rate = 17.925 L/min at 15 kg/cm<sup>2</sup>  
 Maximum discharge rate = 19.040 L/min at 30 kg/cm<sup>2</sup>  
 Discharge at rated pressure = 17.925 L/min at 15 kg/cm<sup>2</sup>

**8 TEST FOR VOLUMETRIC EFFICIENCY OF PUMP**

(Vide Clause 8.4 of IS: 11313 – 2007)

Date of test : 03.09.2024  
 Rated working pressure, kg/cm<sup>2</sup> : 15  
 Engine speed corresponding to rated pressure (rpm) : 3850  
 Theoretical cubic capacity of pump, ml : 18230  
 Actual volume at rated pressure, ml : 17925  
 Volumetric efficiency, % : 98.33

 Report verified by  
 Subrata Kumar Mandal

 Report prepared by  


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**12.2 TEST FOR SPRAY ANGLE OF SPRAY GUN**

The spray angle for fine cone spray pattern at a pressure of 600 kPa is declared as 70° by the applicant. The spray angle corresponding to 600 kPa pressure was observed as 65° to 70°

**12.3 STRENGTH OF GUN**

Sr. No.	Details	Condition
1	Condition of Nozzle Tip	Closed
2	Hydraulic pressure applied	1500 kPa
3	Duration of pressure retained	4 Minute
4	Result	No leak, crack or burst of gun was observed during test

**12.4 SPRAY GUN DESIGNATION : Not Marked**

**12.5 MARKING**

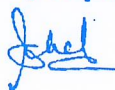
Manufacturer's name or recognized trade mark	:	Not Marked
Batch or Code Number	:	Not Marked

**12.6 ENDURANCE TEST OF GUN (Vide clause E 3.6 of IS: 3652 – 1995)**

1	Date	:	09.09.2024 to 13.09.2024
2	Total Running Time (h)	:	48
3	Quantity of liquid collected and spray angle observed during endurance test		

Sl. No.	Collection	Discharge Rate (ml/min)		Spray Angle (Degree)
		Fine Cone Spray Pattern	Jet Spray Pattern	
a)	First Collection	4000	5050	68°
b)	Second Collection	4070	5100	66°
c)	Third Collection	4100	5020	65°
d)	Fourth Collection	4080	5020	64°
e)	Fifth Collection	4050	5100	68°
f)	Sixth Collection	4100	5080	70°
g)	Seventh Collection	4060	5120	68°
h)	Eighth Collection	4100	5100	70°

**Report prepared by**



**Report verified by**  
Subrata Kumar Mandal

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## 20 CONFORMITY TO INDIAN STANDARDS

1	IS:11313-2007 (Reaffirmed 2012) - Hydraulic power sprayers- specification	:	Partially conforms.
2	Hose and hose connection as per IS:10134-1994	:	Conforms.
3	Spray nozzle and spray gun as per IS:3652- 1995 (Reaffirmed 2011)	:	Partially conforms.
4	IS:7347-1974 (Reaffirmed 2006) – Specification for performance of small size spark ignition engines for agricultural water pumps, sprayers, tillers, reapers and other similar applications	:	Conforms.
5	IS: 2643-2005 - Pipe threads where pressure- tight joint are not made on the threads- dimensions, tolerance and designation.	:	Conforms.

## 21 COMMENTS & RECOMMENDATION

- 21.1 The spray nozzle is not marked and designated. It should be marked and designated as per standard.
- 21.2 The identification mark spray gun is not marked and designated. It should be marked and designated as per standard.
- 21.3 The operator, maintenance & parts manual of sprayer was provided during the test which found inadequate; however, the manual should be updated as per IS: 8132:1999.
- 21.4 Adequate information is not provided in marking and packing as per IS standards. It needs corrective action.
- 21.5 The machine is running smoothly and no rattling sound is observed.

**Report prepared by**

*[Handwritten Signature]*

**Report verified by**

*[Handwritten Signature]*

<b>Farm Machinery Training and Testing Centre, CSIR-Central Mechanical Engineering Research Institute, Durgapur THIS REPORT IS VALID UPTO: 31<sup>st</sup> August, 2031</b>	28 of 29
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## 22 TECHNICAL LITERATURE

The following literatures are provided by the applicant during the test along with the application form.

- User's manual book
- Parts' catalogue
- Service manual

These manuals need to be updated as per IS: 8132-1999.

## TESTING AUTHORITY

Report Prepared by	Senior Technical Officer CSIR-CMERI Farm Machinery Testing Centre	<i>J. J. J.</i> 23/09/2024
Report Verified & Approved by	In-Charge, CSIR-CMERI Farm Machinery Testing Centre	<i>Sudate k. Mandal</i> 23/09/2024
Report Approved for release by	Head, Business Development Unit, CSIR-CMERI, Durgapur	<i>T. P. P.</i> 23/09/24

## 23 APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comments
23	21.1 to 21.5	It's ok corrective action will be taken.

