

**THIS TEST REPORT VALID UP TO : 30<sup>th</sup> June, 2028**



**HYMARK, HK-51-12  
BATTERY OPERATED KNAPSACK 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**

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**[ISO 9001:2015 CERTIFIED]**

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10. Time required to fully charge the battery : 6.5 to 7.8 hours  
with AC charger was observed as

11. The spraying operation time after fully : 6.5 to 8.0 hours  
charging the battery was observed as

### 8. PRESSURE ADJUSTMENT TEST

1. Date of test : 27.04.2023
2. Atmospheric conditions
  - a. Temperature : 35.8 °C
  - b. Relative humidity : 24.1 %
  - c. Pressure : 98.1 kPa
3. Data recorded

Sr. No.	Working pressure (kg/cm <sup>2</sup> )	Fluctuation range (kg/cm <sup>2</sup> )	Pressure drop (kg/cm <sup>2</sup> )	Ratio
1.	2.0	NIL	NIL	--
2.	3.0	NIL	NIL	--
3.	3.5	NIL	NIL	--
4.	4.0	NIL	NIL	--
5.	5.0	NIL	NIL	--

4. Resistance to different pressure: Yes

### 9. TEST FOR SPRAY LANCE (Vide Annex D of IS: 3652 –1995)

Date of test : 26.04.2023  
Type : Straight Type (Type-A)

#### 9.1 STRENGTH OF SPRAY LANCE

Sr. No	Details	Condition
1	Test Condition	Outlet closed
2	Hydraulic pressure applied	1 MPa
3	Duration of pressure retained	5 minutes
4	Result	No leak, crack, or bursting of lance was observed during test

#### 9.2 MARKING ON SPRAY LANCE

Manufacturer's name or recognized trade mark : **Not marked**  
Nominal length : Marked as 525 mm  
Batch or code number : Marked as A-1/26

### 10. TEST FOR CUT-OFF DEVICE (Vide Annex C Clause 6.8.3 of IS: 3652–1995)

Date of test : 26.04.2023  
Type : Trigger type (Type-A)

#### 10.1 MAXIMUM TRIGGER ACTIVATION TORQUE

Required torque	: 35 kgf-cm
Observed torque	: 30.4 kgf-cm





**10.2 STRENGTH TEST FOR CUT-OFF DEVICE**

Sr. No	Details	Condition
1	Condition of outlet	Closed
2	Hydraulic pressure	750 kPa
3	Duration of pressure retained	5 Minutes
4	Observation	No leakage, crack or bursting of cut-off device was observed during test.

**10.3 LEAKAGE AND RELIABILITY TEST FOR CUT-OFF DEVICE**

Date of test : 26.04.2023		
Sr. No.	Details	Condition
1	Test Condition	Mounted on test setup
2	Hydraulic pressure retained	300 kPa
3	Operating cycles	5000 cycles at pressure 300 kPa and repeated for 500 cycles at a pressure of 600 kPa @ 15 cycles per minutes
4	Observation	No drip or leak of cut off device through valve was observed during the test

**10.4 MARKING ON CUT-OFF DEVICE**

- a) Manufacturer's name or recognized trade mark : **Not marked**  
 b) Batch or code number : Marked as A-1/26  
 c) Type of cut off device : **Not marked**

**11. TEST FOR NOZZLE  
(Vide Annex F of IS : 3652-1995)**

Date of test : 25.04.2023  
 Type of Nozzle : Hollow cone type, Fixed type

**11.1 TEST FOR DISCHARGE RATE OF NOZZLE**

**The discharge rate for fine cone spray pattern as 1200 ml/min at a pressure of 300 kPa was declared by the applicant.** The discharge rate corresponding to 300 kPa pressure was observed as below:-

- For fine cone spray pattern : 1170.0 ml/min

**11.2 TEST FOR SPRAY ANGLE OF NOZZLE**

**The spray angle of nozzle at a pressure of 300 kPa was declared by the applicant as 90 degree.** The spray angle corresponding to 300 kPa pressure was observed as 90.5 degree.

**11.3 ENDURANCE TEST OF NOZZLE**

- i) Date : 17.04.2023 to 24.04 .2023  
 ii) Total running time (h) : 48  
 iii) Quantity of liquid collected and spray angle observed during endurance test

Sr. No.	No. of collection	Avg. Discharge rate, ml/min	Spray angle, Degree.
		Fine Cone Spray pattern	
a)	First collection	1155.0	92.0
b)	Second collection	1152.5	91.1
c)	Third collection	1150.0	90.5
d)	Fourth collection	1170.0	91.6
e)	Fifth collection	1172.5	90.5
f)	Sixth collection	1177.5	90.0
g)	Seventh collection	1155.0	92.0
h)	Eighth collection	1160.0	91.1

**Remark: i) Percentage variation in discharge rate at fine cone spray pattern from first to last collection is 0.43 %.**

**ii) The variation in spray angle for fine cone spray pattern from first to last collection is 0.9 degree.**

### 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.1.

- 11.5 NOZZLE DESIGNATION** : Marked as AN 90-1200  
Provision for strainer in nozzle : **Not provided**
- 11.6 MARKING OF NOZZLE**  
Manufacturer's name or recognized trade mark : **Not marked**  
Batch or code number : Marked as A-1/26

### 12. ENDURANCE TEST OF SPRAYER (Vide clause 8.8 of IS: 11313-2007)

- Date of test :- 10.04.2023 to 16.04.2023
- Total running time (h)- 50
- Quantity of liquid collected during endurance:-  
Avg. Discharge (ml/min)
 

a)	First Collection	-	1745.0
b)	Second Collection	-	1720.0
c)	Third Collection	-	1722.5
d)	Fourth collection	-	1745.0
e)	Fifth Collection	-	1725.0
f)	Sixth Collection	-	1715.0
g)	Seventh Collection	-	1715.0
- Percentage variation of discharge from first to last collection is 1.72 %.





16.	Making/labelling of sprayer	The labelling plate should be provided on the body of sprayer having name & address of manufacturer, month & year of manufacture, rated pressure, discharge rate, country of origin.	Just a sticker and not proper labelling plate is provided on the sprayer with following information Hymark Battery operated knapsack sprayer B.No./S.No. A-1/26 Model No. HK-51-12 F-21, Sector-11, Noida (U.P)	Conforms
17.	Literature	Operator manual, service manual & parts catalogue should be provided.	Provided	Conforms

### 18. CONFORMITY TO INDIAN STANDARDS

- i) IS: 11313-2007 Hydraulic power sprayers- : **Partially conform**  
specification
- ii) IS: 10134-1994-Method of test for manually : **Partially conform**  
operated sprayer
- iii) Spray nozzle and spray gun as per IS:3652-1995 : **Partially conform**  
(Reaffirmed 2011)

### 19. COMMENTS & RECOMMENDATIONS

- 19.1 The strainer in nozzle is not provided. It may be provided.
- 19.2 The manufacturer's name or recognized trade mark of nozzle is not marked. It **MUST** be looked into.
- 19.3 The manufacturer's name or recognized trade mark of lance is not marked. It **MUST** be looked into.
- 19.4 The volumetric efficiency of pump does not meet the requirement of Indian Standard. It **MUST** be improved.
- 19.5 The manufacturer's name or recognized trade mark and type of cut off device is not marked. It **MUST** be looked into.
- 19.6 During the hydraulic test of pump chamber, the motor stopped beyond 6.2 kg/cm<sup>2</sup> pressure against the pressure requirement of 8.75 kg/cm<sup>2</sup> and test could not be conducted. It **MUST** be looked into and improved.
- 19.7 During the strap drop test, the buckle/bracket of strap assembly failed to hold the strap in its position. It should be improved as per relevant standard.
- 19.8 The strainer area of cut-off device does not meet the requirement of Indian Standard. It **MUST** be looked into.

- 19.9 The average aperture size of cut off device strainer does not meet the requirement of Indian standard. It must be looked into.
- 19.10 The strap cushion is not provided. It **MUST** be looked into.
- 19.11 A suitable labeling plate (not sticker) needs to be provided with “Interlia” following information.
- i) Manufacturing’s name
  - ii) Make
  - iii) Model
  - iv) Month & year of manufacture
  - v) Rated Speed
  - vi) Rated pressure
  - vii) Discharge rate
  - viii) Power rating
  - ix) Country of origin
- 19.12 i) **Safety provision /safety wear.**  
The safety instructions regarding handling poisonous agro-chemical before, during and after spraying operators should be provided on sprayer.





**20. 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 sprayer should be updated as per IS:8132-1999

**TESTING AUTHORITY**

<b>Er. SANJAY KUMAR</b> <b>AGRICULTURAL ENGINEER</b>	
<b>Dr. MUKESH JAIN</b> <b>DIRECTOR</b>	 15.06.2023

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

**21. APPLICANT'S COMMENTS**

Para No.	Our Reference	Applicant Comments
21.1	19.1	Strainer in Nozzle will be provided.
21.2	19.2	We will mark the nozzle with the recognized Trademark.
21.3	19.3	We will mark the lance with the recognized Trademark.
21.4	19.4	We will improve the volumetric efficiency of the pump.
21.5	19.5	We will mark the type of Cut off Device and recognized Trademark.
21.6	19.6	We will look into and improve the quality and performance of motor.
21.7	19.7	We will improve the strap assembly.
21.8	19.8	We will make the strainer of Cut off Device as per Indian Standard.
21.9	19.9	We will modify and correct to make sure the average aperture size of cut off device strainer is as per Indian Standard.
21.10	19.10	We will provide Strap Cushion
21.11	19.11	We will provide a suitable labeling plate with the required information.
21.12	19.12	We will provide safety instructions regarding handling poisonous agro-chemical before, during and after spraying operations.

