

1/3

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS-294/2040/2017

माह/Month : August, 2017



**HYMARK HK-55
BATTERY CUM HAND OPERATED KNAPSACK SPRAYER**



सत्यमेव जयते

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

Website: <http://nrfmtti.gov.in/>

E-mail: fmti-nr@nic.in

Tele./FAX: 01662-276984

3. TEST FOR DISCHARGE RATE OF PUMP
(Vide Clause 8.3 of IS: 11313 - 2007)

1. Date of test : 03.07.2017
2. Atmospheric conditions :
 - a) Temperature : 32.2 °C
 - b) Relative humidity : 66.4 %
 - c) Pressure : 97.3 kPa
3. Data recorded

Speed of pump (rpm)	Working pressure (kg/cm ²)	Test No.	Delivery from the discharge line (ml/min)	Overflow (ml/min)	Average discharge from the discharge line (ml/min)	Discharge rate of pump (ml/min)
2924	2.0	1	2100	NIL	2125.0	2125.0
		2	2120			
		3	2150			
		4	2130			
2811	3.5	1	1440	NIL	1450.0	1450.0
		2	1450			
		3	1450			
		4	1460			
2688	4.5	1	1150	NIL	1182.5	1182.5
		2	1200			
		3	1200			
		4	1180			
2258	6.0	1	870	NIL	862.5	862.5
		2	880			
		3	860			
		4	840			

Minimum discharge rate = **862.5 ml/min at 6.0 kg/cm²**
Maximum discharge rate = **2125.0 ml/min at 2.0 kg/cm²**
Discharge at rated pressure = **1450.0 ml/min at 3.5 kg/cm²**

4. TEST FOR VOLUMETRIC EFFICIENCY
(Vide Clause 8.4 of IS : 11313 - 2007)

7.1

Date of test	:	03.07.2017
Rated pressure, kg/cm ²	:	3.5
Discharge of water at rated pressure, l/min	:	1.450
Discharge of water at no load, l/min	:	2.658
Pump speed at no load, rev/min	:	3138
Pump speed at rated pressure, rev/min	:	2811
Volumetric efficiency of pump, %	:	61

7.2

Remark:- The volumetric efficiency does not conform to the requirement of IS:11313-2007.

5. POWER REQUIREMENT
(Vide Clause 8.5 of IS – 11313 : 2007)

The power requirement of DC motor fitted on sprayer was observed as following.

1. Avg. motor operating voltage	:	12 V
2. Avg. current drawn by motor at no load	:	0.85 A
3. Avg. current drawn by motor at load	:	2.49 A
4. Avg. motor operating voltage	:	12.26 V
5. Avg. observed motor max. power requirement	:	30.50 Watt
6. Motor speed at no load	:	3140 rpm
7. Motor speed at on load	:	2259 rpm
8. Time required for fully discharge of battery	:	7.8 to 8.4 hr.
9. No load rpm of motor after 6 hours of operation	:	2346 rpm

8.1

6. PRESSURE ADJUSTMENT TEST
(Vide Clause 8.7.1 of IS – 11313 : 2007)

- Date of test : 03.07.2017
- Atmospheric conditions :
 - Temperature : 32.6 °C
 - Relative humidity : 65.8 %
 - Pressure : 97.3 kPa

3. Data recorded

S. No.	Working pressure (kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	2.0	NIL	NIL	--
2.	3.5	NIL	NIL	--
3.	4.5	NIL	NIL	--
4.	6.0	NIL	NIL	--

4. Resistance of pressure: Yes

7. TEST FOR SPRAY LANCE
(Vide Annex. D of IS: 3652-1995)

Date of test	:	02.07.2017
Type	:	Straight type (Type-A)

24. CONFORMITY TO INDIAN STANDARDS

- i) IS: 11313:2007 Hydraulic power sprayers- : **Does not conform in toto**
specification
- ii) IS: 10134-1994-Method of test for manually : **Does not conform in toto**
operated sprayer
- iii) Spray nozzle and spray gun as per IS:3652- : **Does not conform in toto**
1995 (Reaffirmed 2011)
- vi) IS: 2643-2005-Pipe threads where pressure- : **Does not conform in toto**
tight joint are not made on the threads-
dimensions, tolerance and designation

25. COMMENTS & RECOMMENDATIONS

- 25.1 The year of manufacture of sprayer is not marked. It should be marked.
- 25.2 The motor serial number, motor power and rated speed is not specified. It should be specified.
- 25.3 The battery model and country of origin is not specified. It should be specified.
- 25.4 Country of origin of battery charger is not marked. It should be marked.
- 25.5 The model, rated speed and country of origin of pump is not specified. It should be specified.
- 25.6 The dimension of straps does not meet the requirements of Indian Standard. It **MUST** be looked into.
- 25.7 During the strap drop test the buckle/bracket of strap assembly found failed to hold the strap in its position. It should be improved.
- 25.8 The nozzle is not marked. It **MUST** be looked into.
- 25.9 The strap cushion is not provided. It **MUST** be looked into.
- 25.10 The spray angle of nozzle at 300 kPa pressure does not conform to the requirement of IS:3652-1995. It **MUST** be looked into.
- 25.11 The lance is not marked. It **MUST** be marked.


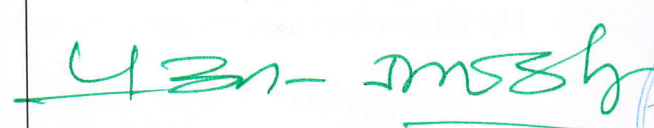
- 25.12 The discharge rate of nozzle for fine cone spray pattern does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 25.13 The trigger actuation force is observed more than as defined in Indian Standard. It **MUST** be examined & improved.
- 25.14 The strainer in nozzle is not provided. It should be provided.
- 25.15 Agitator is not provided in sprayer. It may be provided.
- 25.16 The material of pump inlet port end fitting does not meet the requirement of Indian Standard. It should be looked into.
- 25.17 The cut-off device is not marked. It should be marked.
- 25.18 Time required to full charge battery with AC charger is observed as 9 to 10.3 hours.
- 25.19 The spraying operation time after fully charging the battery was observed as 7.8 to 8.4 hours.
- 25.20 **The volumetric efficiency of sprayer on battery operated mode was observed as 61%, which is not within the requirement of the relevant Indian Standard.**
- 25.21 The current drawn by motor at no load and on load was observed as 0.85 A and 2.49 A respectively which does not conform to requirement of IS: 14459-1997.
- 25.22 The sprayer does not conform to the relevant standard in toto. It **MUST** be looked into.
- 25.23 The nozzle designation is not marked. It **MUST** be looked into.
- 25.24 During the pump chamber hydraulic test the motor stopped beyond 6.0 kg/cm² pressure against the pressure requirement of 8.75 kg/cm². Thus the sprayer does not meet the requirement of Indian Standard.
- 25.25 The pump discharge outlet nipple length does not meet the requirement of Indian Standard. It should be looked into.
- 25.26 The cut-off device strainer area is less than the requirement of Indian Standard. It should be improved.
- 25.27 The cut-off device strainer aperture opening is less than the requirement of Indian Standard. It should be improved.

- 25.28** A suitable labelling plate (not sticker) needs to be provided with ,inter alia ,following information;-
- i. Manufacturer'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

26. TECHNICAL LITERATURE

The operator manual, specification sheet and material construction of different components was provided during the test which found adequate, however, the literature should be updated as per IS: 8132:1999, with the inclusion of safety instructions regarding handling poisonous agrochemical and first aid.

TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	
P. K. PANDEY DIRECTOR	

27. APPLICANT'S COMMENTS

Sr. No.	Applicant's Comments
1.	We will mark the year of manufacture of sprayer in future.
2.	We will specify the motor serial number, motor power and rated speed in further production batches.
3.	We will mention the battery charger model and also the country of origin in future.
4.	We will mark the country of origin of battery charger in future.
5.	We will mention the pump model, country of origin and rated speed of pump in future.
6.	We will amend the dimension of straps to meet the requirement of IS.