

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS-292/2037/2017
माह/Month : August, 2017



**MODERN MTI B-02-1
BATTERY CUM HAND OPERATED KNAPSACK SPRAYER**



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

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PS-292/2037/2017	MODERN MTI B-02-1 BATTERY CUM HAND OPERATED KNAPSACK SPRAYER (COMMERCIAL)
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xxxiv)	The material used for different components shall be declared by the manufacturer, all the components mentioned in the table-I may not be present in a particular sprayer.	Not declared	Does not conform
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**3. TEST FOR DISCHARGE RATE OF PUMP
(Vide Clause 8.3 of IS: 11313 - 2007)**

1. Date of test : 12.06.2017
2. Atmospheric conditions :
 - a) Temperature : 42 °C
 - b) Relative humidity : 32 %
 - c) Pressure : 97.5 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)
3069	1.0	1	2350	NIL	2332.5	2332.5
		2	2330			
		3	2310			
		4	2340			
2972	2.0	1	2030	NIL	2047.5	2047.5
		2	2050			
		3	2070			
		4	2040			
2858	3.0	1	1750	NIL	1760.0	1760.0
		2	1780			
		3	1760			
		4	1750			
2794	4.0	1	1570	NIL	1575.0	1575.0
		2	1610			
		3	1590			
		4	1530			

Minimum discharge rate = **1575.0 ml/min at 4.0 kg/cm²**
Maximum discharge rate = **2332.5 ml/min at 1.0 kg/cm²**
Discharge at rated pressure = **1760.0 ml/min at 3.0 kg/cm²**

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

Date of test	:	12.06.2017
Rated pressure, kg/cm ²	:	3
Avg. discharge of water at rated pressure, l/min	:	1.773
Avg. discharge of water at no load, l/min	:	2.663
Avg. pump speed at no load, rev/min	:	3207
Avg. pump speed at rated pressure, rev/min	:	2861
Volumetric efficiency of pump, %	:	75

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. Motor operating voltage	:	12 V
2. Avg. current drawn by motor at no load	:	0.8 A
3. Avg. current drawn by motor at load	:	2.04 A
4. Avg. motor operating voltage	:	12.36 V
5. Avg. observed motor power requirement	:	25.26 Watt
6. Avg. motor speed at no load	:	3205 rpm
7. Avg. motor speed at on load	:	2794 rpm
8. Avg. Time required for fully discharge of battery	:	7.8 to 8.2 hr.
9. Avg. No load rpm of motor after 6 hours of operation	:	2615 rpm

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

- Date of test : 12.06.2017
- Atmospheric conditions :
 - Temperature : 45 °C
 - Relative humidity : 35 %
 - Pressure : 97.5 kPa
- Data recorded

S. No.	Working pressure (kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	1.0	NIL	NIL	--
2.	2.0	NIL	NIL	--
3.	3.0	NIL	NIL	--
4.	4.0	NIL	NIL	--

- Resistance of pressure: Yes

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

Date of test	:	25.05.2017
Type	:	Gooseneck (Type B ₁)



24. CONFORMITY TO INDIAN STANDARDS

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

25. COMMENTS & RECOMMENDATIONS

- 25.1 The sprayer serial number and year of manufacture is not marked. It should be marked.
- 25.2 The motor make, motor power and rated speed is not specified. It should be specified.
- 25.3 The battery make, model and country of origin is not specified. It should be specified.
- 25.4 Make, model and country of origin of battery charger is not specified. It should be specified.
- 25.5 The model, serial number 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 The metallic threaded connection provided on sprayer does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 25.8 The batch or code number on nozzle is not provided. It **MUST** be looked into.
- 25.9 The strap cushion thickness does not meet the requirement of Indian Standard. 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 with batch or code number. It **MUST** be marked.
- 25.12 The material used for different components is not declared by the manufacturer. It should be declared.
- 25.13 The discharge rate of nozzle at a pressure of 300 kPa for fine cone spray and jet spray pattern does not conform to the requirement of IS: 3652-1995.

- 25.14 The strainer is not provided in cut off device. It may be provided.
- 25.15 The trigger actuation force is observed more than as defined in Indian Standard. It **MUST** be examined & improved.
- 25.16 The strainer in nozzle is not provided. It should be provided.
- 25.17 Agitator is not provided in sprayer. It may be provided.
- 25.18 The material of pump inlet part end filling does not meet the requirement of Indian Standard.
- 25.19 The batch or code number and type of cut-off device is not marked. It should be marked.
- 25.20 Time required to full charge battery with AC charger is observed as 10.1 to 11.3 hours.
- 25.21 The spraying operation time after fully charging the battery was observed as 7.8 to 8.2 hours.
- 25.22 **The volumetric efficiency of sprayer on battery operated mode was observed as 75%, which is not within the requirement of the relevant Indian Standard.**
- 25.23 The current drawn by motor at no load and on load was observed as 0.8 A and 2.04 A respectively which does not conform to requirement of IS: 14459-1997.
- 25.24 The sprayer does not conform to the relevant standard in toto. It **MUST** be looked into.
- 25.25 The nozzle designation marked on nozzle does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 25.26 During the pump chamber hydraulic test the motor stopped beyond 6.0 kg/cm^2 pressure against the pressure requirement of 7.5 kg/cm^2 . Thus the sprayer does not meet the requirement of Indian Standard.
- 25.27 A suitable labelling plate (not sticker) needs to be provided with ,inter alia ,following information;-
- Manufacturer's name
 - Make
 - Model
 - Month & year of manufacture
 - Rated speed
 - Rated pressure
 - Discharge rate
 - Power rating
 - Country of origin
- 25.28 The tank capacity of sprayer does not meet the requirement of Indian Standard. It **MUST** be looked into.