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व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No. : PS-240/1908/2016

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**HYMATIC H805N
BATTERY 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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D-4.3.1	The inlet of the spray lance shall be attached to a Hydraulic pump directly or through a delivery hose. The outlet of the lance shall be closed that is no discharge shall be allowed from the lance. A hydraulic pressure of 1MPa or two and half time of the nominal working pressure of the sprayer (for which the lance is meant) which ever is more shall be applied to the lance up to a period of 5 minutes. During the test, the lance shall not leak, crack or burst.	No leakage, crack or burst is observed during test.	Conforms
D-5 MARKING	The lance shall be marked with the following particulars:		
a)	Manufacturer's name or recognized trade-mark,	marked	conform
b)	Nominal length, and	Not marked	Does not conform
c)	Batch or code number.	Not marked	Does not conform
6.14 Nozzle	Unless otherwise specified by the purchaser, the nozzle shall conform to the requirement as given in Annexure-F of IS: 3652-1995.		
ANNEXURE F HYDRAULIC SPRAY NOZZLES (CL 6.8.4 OF IS 3652:1995)			
F-1 Types F-1.1	On the basis of spray distribution the nozzles shall be of the following types:- a) Hollow cone type b) Fan type c) Adjustable type i) Double action type ii) Triple action type.	Hollow cone type	Conforms
F-1.2	On the basis of the method of attachment, the nozzles shall be of the following types:-		
	a) Fixed type	NA	--
	b) Swivel type	Swivel	Conforms
F-3 PERFORMANCE REQUIREMENTS			
F-3.1 Rate of discharge F-3.1.1	The discharge rate of the nozzle shall be declared by the manufacturer. In case of adjustable nozzle, the declared value shall be for extreme adjustments for cone and jet spray patterns at a pressure of 300 kPa.	Declared by the manufacturer.	Conforms

F-3.1.2	When tested in accordance with F-7, The nozzles shall provide a rate of discharge as given in Table-3. The rate of discharge shall be within ± 5 percent for fixed type and ± 10 percent for adjustable type of nozzle, of the declared value.	The rate of discharge is as given in table 3 of IS: 3652-1995. Rate of discharge is 1497 ml/min.	Conforms
F-3.2 Spray Angle	The spray angle of the nozzle shall be declared by the manufacturer. The angle, when tested in accordance with method given in F-9 shall not differ by ± 3 deg. for fixed type and ± 5 deg. for adjustable type nozzles from the declared value.	The maximum spray angle of nozzle is 79.71 deg. as measured. The spray angle value is not declared by manufacturer.	Does not conform
F-3.3 Endurance test	The hydraulic spray nozzle when tested in accordance with F-7 and F-9 at a pressure of 300 ± 30 kPa after operating for 48 hour duration with continuous stretches of 6h, variation in discharge rate and spray angle from initial values should not be more than ± 5 percent and ± 3 deg. respectively.	Endurance test of spray nozzle completed and variation in discharge and spray angle is 1.42 % & 0.69 % respectively.	Conforms
F-4 Other Requirements F-4.1	If strainer is provided, the average size of any side or diameter of the apertures shall be not more than 450 μm .	Strainer is not provided in the nozzle.	Conforms
F-4.2	At the option of the purchaser the provision shall be made for rotating the nozzle by hand to make it swivel type.	NA	--
F-5 Designation F-5.1	The cone and fan nozzle shall be designated by its identification mark, spray angle and discharge rate. An adjustable nozzle shall be designated by its identification mark AN-C-J for cone and Jet spray pattern and discharge rate at a controlled pressure of 300 kPa.	Not marked	Does not conform
F-6 Workmanship & Finish F-6.1	The components of the spray nozzles shall be free from burrs and other defects; this applies particularly to the internal surfaces and specially to the orifice.	Satisfactory	Conforms
F-6.2	The mating faces of the cap, tip and nozzle body or boss, shall be finished flat so as to seal on the end face of the nozzle body or boss, a gasket may be used, if necessary.	Mating faces of nozzle body is provided with gaskets to seal on the end face of nozzle body.	Conforms
F-6.3	The screw thread shall be well formed and the crests of the threads shall be free from burrs or any other defects which may prevent free engagement.	Satisfactory	Conforms

Cl.7.3.4 Choice of operation	The sprayer may be supplied with arrangement for operating lever to be fixed either on right or on left side.	Not applicable	--
Cl.7.3.5	Each spray shall be provided with a set of mask ,hand gloves and safety goggles	A set of mask hand gloves and safety goggles is provided with sprayer.	Conforms
Cl.8 Workmanship & Finish	The components of the sprayer shall have a smooth finish and shall be free from pits burrs, sharp edges and other defects, that may be detrimental for their use.	Satisfactory	Conforms
Cl. 8.2	The exposed mild steel parts shall have a protective coating to prevent surface deterioration. The steel used for hose ferrule/clip shall be plated with cadmium, zinc or nickel exposed brass parts may be given a suitable protective finish with clear transparent lacquer.	Metallic part are coated with enamel paint.	Conforms
Cl. 9 Marking & Packing	Each sprayer shall be marked with the following particulars		
Cl. 9.1 Marking	a) Manufacturer's name or recognized trade mark	Marked As Hymatic Agro Equipment	Conforms
	b) Batch or Serial No.	Provided	Conforms
	c) Tank nominal capacity	16 ltr.	Conforms
Cl.9.3 IS:3906-1995 Packing	Each sprayer shall be packed as agreed to between the purchase and the supplier for safe handling in transit.		

4. SUMMARY OF OBSERVATION

- 4.1 Discharge rate was observed as 1497 ml/min and 816.3 ml/min AT 300 kPa pressure against the minimum requirement of 500 ml.
- 4.2 The endurance test for 48 hours was conducted.
- i) No noticeable breakdown or leakage was observed during the test.
 - ii) Discharge variation was observed as 1.42%, which is within limit of $\pm 5\%$.

5. COMMENTS & RECOMMENDATIONS

5.1 Conformity to Indian Standard

The time required for full charging of battery was observed as 8 to .5 hr. the sprayer operation time after full charging was observed as 3 to 5 hrs.
Hymatic H805N battery operated sprayer does not conform the following requirements specified in Indian Standard. These should be rectified as per relevant Indian Standard.

- i) Cl. 4.1 IS: 3652-1995 – Material for spray lance and Nipple is not as per IS.
- ii) Cl.6 IS 3906:1995 – The width of strap is not as per IS.
- iii) Cl. 6.5 IS: 3652 – 1995- Threaded connections are not as per IS



- iv) Cl. 6.10 IS: 3906-1995- Discharge out let nipple length is on power side.
 - v) C- 3.2 – The Strainer area is less than 1000 mm².
 - vi) C -3.2.1 – The average size of any side or diameter of apertures of the strainer is 900 µm more than the specified limit of 450 µm.
 - vii) C-6.2 - The maximum trigger actuation torque is 42 Kgf-cm. This is at higher side than the specified in IS.
 - viii) C-10 Marking-b) Batch or code number is not marked on cut of device as per IS.
 - ix) C-10 Marking-c) Type of cut-off device is not marked on cut of device as per IS.
 - x) Cl. 6.8.3 IS: 3652-1995 D-2 Material of spray lance is not as per IS.
 - xi) Cl. 6.8.3 IS: 3652-1995 D-5 b) Nominal Length is not marked as per IS.
 - xii) Cl. 6.8.3 IS: 3652-1995 D-5 c) Batch or code number is not marked as per IS.
 - xiii) F-3.2 – Spray Angle is not declared by manufacturer.
 - xiv) Cl. 6.14 Sub. Clause F 5(b) IS: 3652-1995 Nozzle designation is not provided.
 - xv) Cl. 6.14 Sub. Clause F (a), 11 (b) & (c) IS: 3652-1995- Nozzle marking is not provided.
 - xvi) Cl.7 IS 3906-1995 sub clause - Cl.7.3.1 Strap cushion is not provided as per IS. It may provide.
 - xvii) Cl.7 IS 3906-1995 sub clause - Cl.7.3.3 Agitator is not provide. It may provided.
 - xviii) The working pressure of sprayer is not declared by applicant. It should be essentially declared.
- 5.2 Spray distribution pattern is complying in fig. 221 Rectangular distribution limit as per IS: 3652-1995.
- 5.3 **Safety provisions/safety wear**
- i) Safety signs and hazard pictorials are not provided on the machine. It must be provided for the safety of the users.
 - ii) The accessories viz mask, hand gloves and safety goggles for operator's safety are provided with sprayer.
 - ii) The safety instructions regarding handling of poisonous chemicals & first aid should be provided in operator's manual.