

THIS TEST REPORT VALID UP TO : 31st July, 2027



**RICOITALY, RI-16B
HAND 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

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[ISO 9001:2015 CERTIFIED]

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4. RUNNING – IN

The sprayer was run-in 1.0 hour as recommended by the applicant before starting of test.

5. TEST FOR DISCHARGE RATE
(Vide Clause 6.1.3 of IS 10134-1994)

1. Date of test : 02.07.2022
2. Atmospheric conditions
 - a) Temperature : 36.4°C
 - b) Relative humidity : 49.7 %
 - c) Pressure : 97.2 kPa

Data recorded

No. of hand strokes per minute	Working Pressure (kPa)	Test No.	Delivery from the discharge line (ml/min)	Overflow (ml/min)	Average delivery from the discharge line (ml/min)	Discharge rate of pump (ml/min)
16	300	1	650	Nil	645.0	645.0
16	300	2	630	Nil		
16	300	3	660	Nil		
16	300	4	640	Nil		

Average discharge rate: 645.0 ml/min at 300 kPa pressure

6. TEST FOR VOLUMETRIC EFFICIENCY
(Vide Clause 6.2 of IS 10134-1994)

Date of test : 02.07.2022			
Sr. No.	Details	:	Observation
1.	Discharge of water in 10 successive stroke	:	372.5 ml
2.	No. of cycle in one minute	:	10
3.	Actual volume of water in one cycle	:	37.25 ml
4.	Inner diameter of pump cylinder	:	45 mm
5.	Stroke length at normal working pressure	:	35 mm
6.	Piston displacement	:	55.64 cc
7.	Theoretical volume of water in one cycle	:	55.64 ml
8.	Volumetric efficiency, %	:	66.95 %

Remarks - The volumetric efficiency of pump does not conform to the requirement of IS: 10134 -1994.

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

Date of test : 02.07.2022
 Type : Straight Type (Type - A)

7.1 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

7.2 MARKING ON SPRAY LANCE

- a) Manufacturer's name or recognized trade mark : **Not marked**
 b) Nominal length, mm : **Not marked**
 c) Batch or code number : **Not marked**

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

Date : 02.07.2022
 Type : Trigger type (Type-A)

8.1 MAXIMUM TRIGGER ACTUATION TORQUE

Required torque	:	Less than 35 kgf-cm
Observed torque	:	32.3 kgf-cm

8.2 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.

8.3 LEAKAGE AND RELIABILITY TEST FOR CUT-OFF DEVICE

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 @ approx.15 cycles per minutes
4	Observation	No drip or leak of cut-off device through valve was observed during the test.

8.4 MARKING ON CUT-OFF DEVICE

- a) Manufacturer's name or recognized trade mark : **Not marked**
 b) Batch or code number : **Not marked**
 c) Type of cut-off Device : **Not marked**

9. TEST FOR PRESSURE CHAMBER
(Vide Clause 7.1 of IS 10134-1994)

Date of test : 02.07.2022

Sr. No	Details	Condition
1	Test Condition	Outlet end closed
2	Pressure applied -Hydraulic pressure -Pneumatic pressure	7.5 kg/cm ² 4.5 kg/cm ²
3	Duration	1 minutes each
4	Result	No leakage, crack, deformation or breakage observed in pressure chamber during the test.

10. TEST FOR OPERATING LEVER, HANDLE & PISTON ROD
(Vide clause 7.6 of IS-10134:1994)

Date of test : 02.07.2022

Sr. No	Details	Condition
1	Test Condition	Discharge outlet closed
2	Pressure applied	7.5 kg/cm ²
3	Result	No distortion, crack or break observed in handle, operating lever and piston rod during the test.

11. ENDURANCE TEST OF SPRAYER
(Vide clause 8.1 of IS-10134:1994)

1. Date: 13.06.2022 to 21.06.2022
2. Total running time (h) - 48
3. Quantity of liquid collected during endurance:-
Avg. discharge (ml/min)
 - a) First Collection - 642.5
 - b) Second Collection - 635.0
 - c) Third Collection - 637.5
 - d) Fourth collection - 632.5
 - e) Fifth Collection - 645.0
 - f) Sixth Collection - 637.5
 - g) Seventh Collection - 607.5
 - h) Eighth Collection - 625.0

Remark: - Percentage variation of discharge from first to last collection is 2.72%.**12. TEST FOR STRAP AND ITS ASSEMBLY**
(Vide Clause 7.3 of IS 10134-1994)

Date of test : 02.07.2022

The sprayer was filled with clean water to its specified capacity. The sprayer was hung from a solid support by its straps simulating its carriage on the shoulder of an operator. The tank was vertically raised to height of 300 mm and was allowed to drop freely and hung by straps.

Observation : At 3rd drop, the buckle of strap assembly failed to hold the strap in its position.

13. TEST FOR NOZZLE
[Vide Annex F of IS: 3652-1995]

Date of test : 30.06.2022
Type of Nozzle (apa) : Solid Cone Type

13.1 TEST FOR DISCHARGE RATE OF NOZZLE

The discharge rate for fine cone spray pattern & jet spray pattern as 500 ml/min & 750 ml/min at a pressure of 300 kPa was declared by the applicant. The discharge rate corresponding to 300 kPa pressure was observed as under:-

- For fine cone spray pattern : 635.0 ml/min

Remarks:- The discharge rate for fine cone spray pattern does not conform to the requirement of IS: 3652-1995

13.2 TEST FOR SPRAY ANGLE OF NOZZLE

The spray angle of nozzle at a pressure of 300 kPa has been declared by applicant as 60 degree. The spray angle corresponding to 300 kPa pressure was observed as 73.9 degree.

Remarks:- The spray angle for fine cone spray pattern at the pressure of 300 kPa is not within the limit specified by the relevant code/standard.

13.3 ENDURANCE TEST OF NOZZLE

- i) Date : 22.06.2022 to 30.06.2022
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 at Fine cone spray pattern, ml/min	Spray angle, degree
a)	First collection	637.5	72.5
b)	Second collection	632.5	73.2
c)	Third collection	630.0	71.9
d)	Fourth collection	640.0	74.6
e)	Fifth collection	617.5	73.2
f)	Sixth collection	627.5	71.2
g)	Seventh collection	640.0	73.2
h)	Eighth collection	627.5	74.6

Remarks : i) Percentage variation in discharge rate for fine cone spray pattern from first to last collection is 1.57 %

ii) The variation in spray angle for fine cone spray pattern from first to last collection is 2.1 degree.

13.4 SPRAY DISTRIBUTION PATTERN OF NOZZLE

The liquid discharge from nozzle at 300 kPa pressure was collected in glass tubes of patternator. The spray pattern as per the quantity of liquid collected is represented in tabular form and in Fig. 1.

13.5 NOZZLE DESIGNATION : Not marked
Provision for strainer in nozzle : Not provided

13.6 MARKING OF NOZZLE
Manufacturer's name or recognized trade mark : Not marked
Batch or code number : Not marked
Nozzle designation : Not marked

DATA FOR SPRAY DISTRIBUTION PATTERNATOR TEST OF NOZZLE

No. of tube	8	7	6	5	4	3	2	1	Centre	1	2	3	4	5	6	7	8
Discharge in ml	04	10	16	30	52	67	97	105	144	103	90	85	42	20	12	10	09

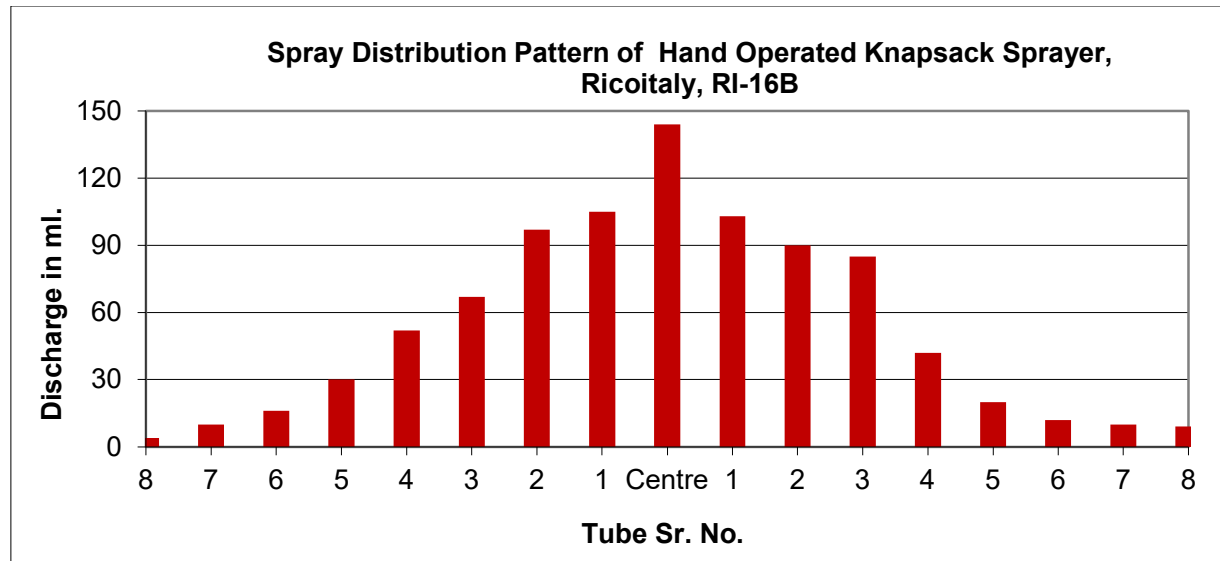


FIG. 1 : SPRAY DISTRIBUTION PATTERN

16.	Making/labeling of sprayer	The labeling 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.	Emerged on the sprayer with following information Ricoitaly Ramsons Impex, India	Partially Conform
17.	Literature	Operator manual, service manual & parts catalogue should be provided.	Provided	Conforms

Note:- The implementation of critical technical specifications has been deferred till 30.09.2022 vide Ministry's O.M. No. 13-1/2021 M&T (I&P) dated 03.02.2022

17. CONFORMITY TO INDIAN STANDARDS

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

18. COMMENTS & RECOMMENDATIONS

- 18.1 The Serial Number of pump is not specified. It should be specified.
- 18.2 The discharge rate of nozzle at pressure of 300 kPa for fine cone spray pattern does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 18.3 The strainer in nozzle is not provided. It may be provided.
- 18.4 The pump volumetric efficiency does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 18.5 The spray angle for fine cone spray pattern of spray nozzle at the pressure of 300 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked into.
- 18.6 The manufacturer's name or recognized trade mark, batch or code number and designation of nozzle is not marked. It **MUST** be looked into.
- 18.7 Agitator is not provided in sprayer. It may be provided.
- 18.8 The manufacturer's name or recognized trade mark, nominal length, batch or code number of lance is not marked. It **MUST** be looked into.
- 18.9 The strap cushion is not provided. It may be provided.
- 18.10 The dimension of straps do not meet the requirement of Indian standard. It may be looked into.
- 18.11 The average aperture size of filling hole strainer does not meet the requirement of Indian standard. It **MUST** be looked into.
- 18.12 The strainer area of cut-off device does not meet the requirement of Indian standard. It **MUST** be looked into.

- 18.13** Necessary tools are not provided. It **MUST** be provided.
- 18.14** 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.
- 18.15** The safety wear is not provided. It **MUST** be provided.
- 18.16** The length of the operating trigger does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 18.17** The nominal length of spray lance does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 18.18** The back rest cushion is not provided. It may be provided.
- 18.19** A suitable labeling plate (not sticker) needs to be provided with "Interlia" following information.
- (i) Manufacturer's name
 - (ii) Make
 - (iii) Model
 - (iv) Month & year of manufacturer
 - (v) Rated pressure
 - (vi) Discharge rate
 - (vii) Country of origin
- 18.20 Safety Provision/Safety Wear**
- i) The safety instructions regarding handling poisonous agrochemical before, during and after spraying operation should be provided on sprayer.



19. TECHNICAL LITERATURE

The following literature are provided with sprayer for guidance to the user.

- i) Operators manual
- ii) Service manual
- iii) Parts catalogue

However, the manuals of sprayer should be updated as per IS : 8132 -1999

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 27.07.2022

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

20. APPLICANT'S COMMENTS

No specific comments received by the applicant.