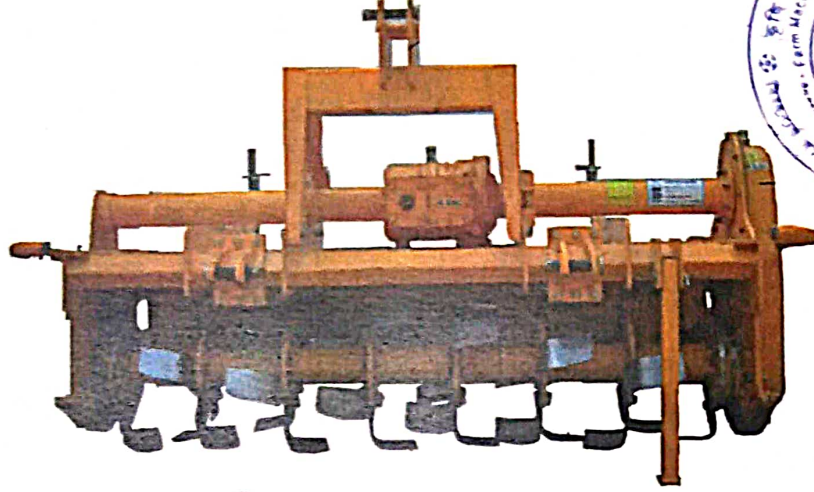




THIS TEST REPORT IS VALID UPTO 31.01.2028



SWAN AGRO ROTARY TILLER (ROTAVATOR), MODEL: NSML RTSU162
MULTI SPEED, GEAR DRVE, CENTRALLY MOUNTED



सत्यमेव जयते

भारत सरकार

GOVT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि, सहकारिता एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE

उत्तर पूर्व क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

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1.SCOPE OF TEST

The scope of test was to check and assess the following:

1.1 Laboratory Test:

- a) Checking of specifications
- b) Hardness of soil engaging parts/blades of Rotary tiller (Rotavator)
- c) Chemical analysis of critical components/blades of Rotary tiller (Rotavator)
- d) Wear analysis of critical components/blades of Rotary tiller (Rotavator)

1.2 Field Test :

- a) Rate of work
- b) Quality of work
- c) Ease of operation and adjustments
- d) Labour requirement
- e) Defects, Breakdowns & Repairs

2. METHOD OF SELECTION

As per Govt. of India, OM No. 13-13/2020-M&T (I&P), dated 10.09.2020, the random selection was exempted. Hence, the machine was directly submitted by the applicant at this Institute for test.

3. TEST PROCEDURE

IS: 17045 : 2018 : Rotary Tiller (Rotavator) – Tractor Driven – Test Procedure and Recommendations on Selected Performance Characteristics

4. SPECIFICATIONS**4.1 General:**

Name and address of the manufacturer	: M/s New Swan Multitech Ltd. Vill. Raian, P.O. Heeran, Kohara-Machiwara Road, Ludhiana, Punjab Pin – 141 112
Name & Address of Applicant	: M/s New Swan Multitech Ltd. Vill. Raian, P.O. Heeran, Kohara-Machiwara Road, Ludhiana, Punjab Pin – 141 112
Name of machine	: Rotary Tiller (Rotavator)
Type	: Multi Speed, Gear Drive, Centrally Mounted,
Make	: Swan Agro
Model	: NSML RTSU162
Year of manufacture	: 2020
Serial Number	: 42070
Recommended power source, hp	: 35-40 (As per Applicant)
Type of blade	: Hatchet (L-Shaped)
Size (cm) {Rotor Dia. x Working width}	: 45.8 x 163.2

Constituents	As per IS: 6690-2002		Composition As observed (% of weight)	Remarks*
	Carbon Steel	Silicon Manganese Steel		
Carbon (C)	0.70 -0.85	0.50-0.60	0.297	Does not Conform
Silicon (Si)	0.10 -0.40	1.50-2.00	0.155	Conforms
Manganese (Mn)	0.50 -1.0	0.50-1.00	1.282	Does not Conform
Sulphur (S)	0.05 (max)	0.05 (max)	0.008	Conforms
Phosphorous (P)	0.05 (max)	0.05 (max)	0.011	Conforms

*As per applicant, the material used for rotor blades is Boron Steel.

6. RUNNING –IN

Running-in was not recommended by the applicant. However, the rotary tiller (rotavator) was run-in for 1.0 hour before the actual test. All the fasteners were checked and tightened thereafter.

7. FIELD PERFORMANCE TEST

The field test of the implement comprising of wet land and dry land operation were conducted for 10.25 and 25.31 hours, respectively to assess the performance of the implement. The performance of implement is reported in Annexure-I & II for wet land and dry land operations, respectively. The tractor was operated at standard PTO speed (540±10) and observations are summarized in the following table.

Summary of Field Performance Test

S. No.	Parameters/operations	Wet land operation (Puddling)	Dry land operation
1	Gear Used	L-2	L-2
2	Engine speed (rpm)		
	- No load	1699 to 1708	1727 to 1730
	- On load	1665 to 1668	1670 to 1676
3	Type of soil	Light	
4	Depth of standing water (cm)/ soil moisture (%)	10.53 to 10.80	10.2 to 11.5
5	Bulk density of soil (g/cc)	--	1.36 to 1.48
6	Speed of operation (kmph)	2.43 to 2.53	3.13 to 3.44
7	Travel reduction (%) / Wheel slip (%)	0.76 to 2.27	-4.75 to -1.62
8	Depth of puddle (cm) / Depth of cut (cm)	26.0 to 32.4	8.60 to 8.93
9	Working width (cm)	--	165 to 168
10	Area covered (ha/h)	0.474 to 0.478	0.431 to 0.469
11	Time required for one ha (h)	2.09 to 2.11	2.13 to 2.32
12	Puddling Index (%) / Field efficiency(%)	77.0 to 80.5	82.41 to 85.71
13	Power requirement, kW	NR	25.50 to 26.15
14	Fuel consumption		
	- l/h	4.48 to 4.52	6.55 to 6.80
	- l/ha	--	14.12 to 15.4

Wet land operation :

The tractor was operated without cage wheel for puddling operation of rotary tiller (rotavator).

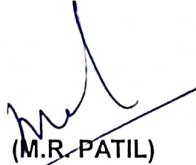
1	2	3	4	5	6	7
v	Country of origin	Evaluative	Should be provided on rotary tiller (Rotavator)	--	Provided	Yes
vi	Year of manufacture			--	Provided	Yes
vii	Chassis Serial Number			--	Provided	Yes
viii	Recommended PTO speed of Prime mover(rpm)			--	Provided	Yes
ix	Maximum PTO power requirement, kW			--	Provided	Yes
8	Category of breakdowns/ defects					
	Category of breakdowns	Category Evaluative/ Non Evaluative	Requirements	As Observed	Whether meets the requirements (Yes/ No)	
i	Critical breakdown	Evaluative	No critical breakdown	None	Yes	
ii	Major breakdown	Evaluative	Not more than one and neither of them should be repetitive in nature.	None	Yes	
iii	Minor breakdowns	Evaluative	Not more than three and frequency of each should not be more than two.	None	Yes	
iv	Total breakdowns	Evaluative	In no case, the total no of breakdown should exceed four, i.e. (1 major + 3 minor) or 4 minor breakdowns	None	Yes	

11. COMMENTS AND RECOMMENDATIONS

- 11.1 In dry land operation, average depth of cut was recorded as 8.80 cm which does not meet the requirement of Indian Standard, IS 17045:2018. It should be looked into for corrective action.
- 11.2 Specifications of hitch pyramid (three point linkage) does not conform to IS: 4468-1997(Part-1) and it should be looked into for corrective action.
- 11.3 Dimensions of Power Input Connection (PIC) of implement does not conform to IS: 4931-1995 and it should be looked into for corrective action.
- 11.4 Dimensions of PIC yoke bore do not conform to IS: 4931-1995 and it should be looked into for corrective action.
- 11.5 On the labeling plate of machine, Max. PTO power required (kW) has been mentioned. It should be Min. PTO power required or should be a suitable power range. It should be looked into for corrective action.

- 11.6 The percentage of carbon and manganese content in composition of rotary tiller blade material does not conform to IS: 6690-2002. The carbon content was on lower side and manganese content was on higher side when compared with the relevant Indian Standard. It should be looked into for corrective action.
- 11.7 The hardness of Shank & Edge portion of rotor blades does not conform to Indian Standard, IS: 6690-2002. It should be looked into for corrective action.
- 11.8 Four rotor speeds have been mentioned in the lable on the machine, however only two rotor speeds can be achieved. It should be looked into for corrective action.

TESTING AUTHORITY



(M.R. PATIL)

AGRICULTURAL ENGINEER



(J.P. MANDAL)

SENIOR AGRICULTURAL ENGINEER



(K.K. NAGLE)
DIRECTOR



Draft test report compiled by - Shri. Khagendra Bora, Sr. Technical Assistant

12. APPLICANT'S COMMENTS

No comments received from the Applicant.