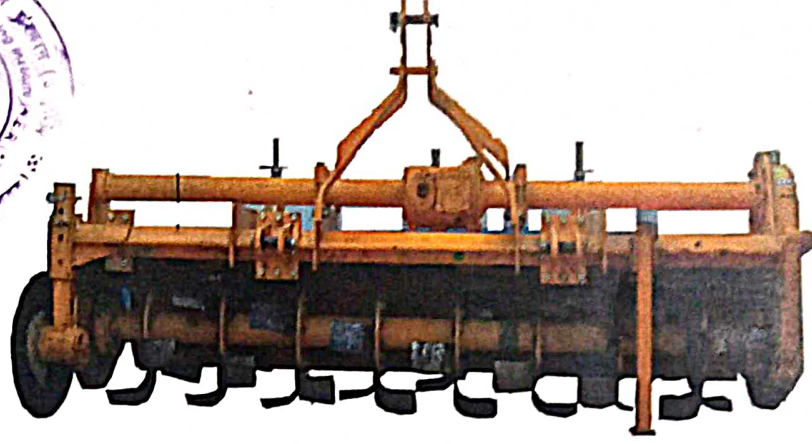


व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)  
COMMERCIAL TEST REPORT (Initial)



संख्या/No.: Imp. 290/371  
माह / Month: January 2021

THIS TEST REPORT IS VALID UPTO 31.01.2028



SWAN AGRO ROTARY TILLER (ROTAVATOR), MODEL: NSML RTJT200  
MULTI SPEED, GEAR DRIVE, CENTRALLY MOUNTED



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

बिश्वनाथ चरियाली: बिश्वनाथ: असम, पिन-784 176

BISWANATH CHARIALI: BISWANATH: ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Ph. No. 03715-222094

Website: <http://nerfmtti.nic.in>

Fax No: 03715-230358

E-Mail: [fmti-ner@nic.in](mailto:fmti-ner@nic.in)

**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	: <b>New Swan Multitech Ltd.</b> Vill. Raian, P.O. Heeran, Kohara-Machiwara Road, Ludhiana, Punjab Pin – 141 112
Name & Address of Applicant	: <b>New Swan Multitech Ltd.</b> 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 RTJT200
Year of manufacture	: 2020
Serial Number	: 45588
Recommended power source, hp	: 50-55
Type of blade	: Hatchet (L-Shaped)
Size (cm) {Rotor Dia. x Working width}	: 45 x 202.5



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 confirm
Silicon (Si)	0.10 -0.40	1.50-2.00	0.155	Confirms
Manganese (Mn)	0.50 -1.0	0.50-1.00	1.282	Does not confirm
Sulphur (S)	0.05 (max)	0.05 (max)	0.008	Confirms
Phosphorous (P)	0.05 (max)	0.05 (max)	0.011	Confirms

\*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 10.24 and 25.83 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-1	L-2
2	Engine speed (rpm)		
	- No load	2035 to 2035	2046 to 2080
	- On load	2002 to 2002	2007 to 2013
3	Type of soil	Light	
4	Depth of standing water (cm)/ soil moisture (%)	10.66 to 10.73	15.65 to 18.69
5	Bulk density of soil (g/cc)	--	1.34 to 1.77
6	Speed of operation (kmph)	2.18 to 2.25	3.55 to 3.96
7	Travel reduction (%)/ Wheel slip (%)	3.95 to 5.24	-4.89 to -1.49
8	Depth of puddle (cm)/ Depth of cut (cm)	31 to 31.8	7.16 to 8.87
9	Working width (cm)	--	202 to 204
10	Area covered (ha/h)	0.447 to 0.508	0.634 to 0.684
11	Time required for one ha (h)	1.96 to 2.23	1.46 to 1.58
12	Puddling Index (%)/ Field efficiency(%)	79.80 to 80.95	84.21 to 88.36
13	Power requirement, kW	NR	NR
14	Fuel consumption		
	- l/h	4.52 to 4.84	6.74 to 7.16
	- l/ha	8.86 to 10.79	9.85 to 11.15

### 7.1 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	

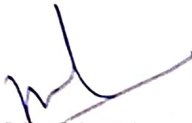
### 11. COMMENTS AND RECOMMENDATIONS

- 11.1 In dry land operation, average depth of cut was recorded as 8.34 cm which does not meet the requirement of Indian Standard, IS 17045:2018.
- 11.2 Ingress of water was observed in primary reduction gear box oil after field tests which do not comply with IS 17045:2018. It should be looked into for corrective action.
- 11.3 Dimensions of Three point linkage of implement do not conform to IS: 4468-1997 (Part-1) and it should be looked into for corrective action.
- 11.4 Dimensions of PIC of implement do not conform to IS: 4931-1995 and it should be looked into for corrective action.
- 11.5 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.

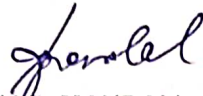
- 11.6 The hardness of Shank & Edge portion of rotor blades does not conform to Indian Standard, IS: 6690-2002. It should be looked into for corrective action.
- 11.7 Clogging of soil and weeds at rotor axle and flanges during dry land operation was observed. It should be looked into for improvement.
- 11.8 The dip stick for checking oil level in primary reduction gear box was found bend. It should be looked into for corrective action.
- 11.9 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. Also the power required (kW) as mentioned on the labeling plate of machine and as mentioned in the specification sheet was different. It should be looked into for corrective action.
- 11.10 Four rotor speeds have been mentioned in the table 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. M.R. Patil, Agricultural Engineer

#### 12. APPLICANT'S COMMENTS

No comments received from the Applicant.