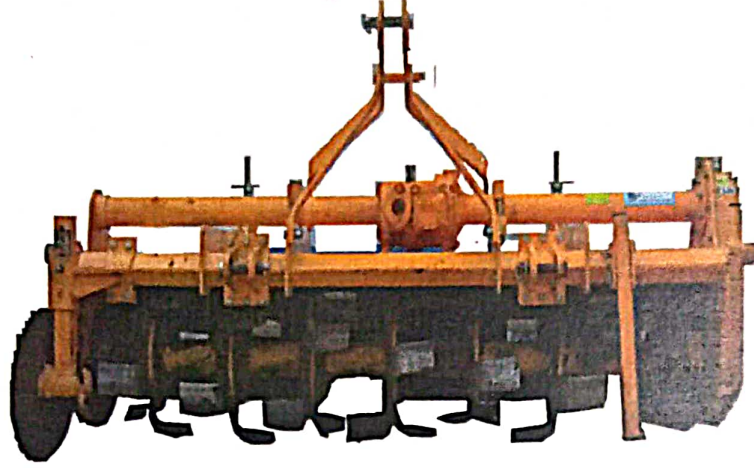




THIS TEST REPORT IS VALID UPTO 31.01.2028



**SWAN AGRO ROTARY TILLER (ROTAVATOR), MODEL: NSML RTJT175
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

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[AN ISO 9001:2015 CERTIFIED INSTITUTION]

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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 for test by the applicant at this Institute.

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-Machhiwara
Road, Ludhiana, Punjab- 141112

Name & Address of Applicant : **M/S NEW SWAN MULTITECH LTD.**
Vill. Raian, P.O, Heeran, Kohara-Machhiwara
Road, Ludhiana, Punjab- 141112

Name of machine : Rotary Tiller (Rotavator)
Type : Multi Speed, Gear Drive, Centrally Mounted,
Make : Swan Agro
Model : NSML RTJT175
Year of manufacture : 2020
Serial Number : 46804
Recommended power source, hp : 45 to 50 (As per Applicant)
Type of blade : Hatchet (L-Shaped)
Size (cm) {Rotor Dia. x Working width} : 45.0 x 177.2

5.2 Chemical composition of Rotor Blade:

The material of rotary tiller (rotavator) blade was got analyzed for chemical composition. The results of chemical analysis test are as under:-

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 10.62 and 26.09 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

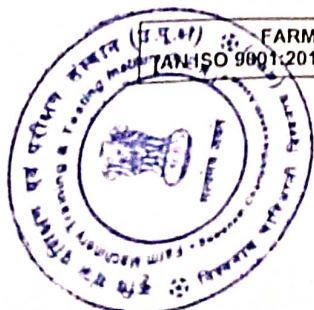
S. No.	Parameters/operations	Wet land operation (Puddling)	Dry land operation
1	Gear Used	A-2	A-2
2	Engine speed (rpm)		
	- No load	2468 to 2473	2503 to 2517
	- On load	2416 to 2420	2429 to 2446
3	Type of soil	Light	
4	Depth of standing water (cm)/ soil moisture (%)	10.60 to 10.66	16.05 to 18.69
5	Bulk density of soil (g/cc)	--	1.34 to 1.48
6	Speed of operation (kmph)	2.70 to 2.78	3.12 to 3.34
7	Travel reduction (%)/ Wheel slip (%)	0.57 to 2.08	-4.8 to -1.25
8	Depth of puddle (cm)/ Depth of cut (cm)	22.0 to 25.6	8.03 to 9.03
9	Working width (cm)	--	183 to 184
10	Area covered (ha/h)	0.4516 to 0.459	0.4927 to 0.5426
11	Time required for one ha (h)	2.17 to 2.21	1.84 to 2.03
12	Puddling Index (%)/ Field efficiency (%)	74.03 to 80.58	84.95 to 88.87
13	Power requirement, kW	--	24.0 to 28.0
14	Fuel consumption		
	- l/h	4.80 to 5.20	6.62 to 7.09
	- l/ha	10.42 to 11.01	12.18 to 14.25

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 breakdowns	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 Dimensions of Three point linkage of implement does not conform to IS: 4468-1997(Part-1) and it should be looked into for corrective action.
- 11.2 Dimensions of PIC of implement does not conform to IS: 4931-1995 and it should be looked into for corrective action.
- 11.3 In dry land operation average depth of cut was recorded as 8.56 cm which does not meet the requirement of Indian Standard.
- 11.4 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.
- 11.5 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.
- 11.6 Clogging of soil and weeds at rotor axle and flanges during dry land operation was observed. It should be looked into for improvement.
- 11.7 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.

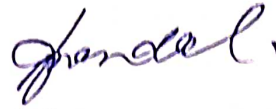


- 11.8 Four rotor speeds have been mentioned in the table on the machine, however only two rotor speeds can be achieved. It should be looked into for corrective action.

TESTING AUTHORITY

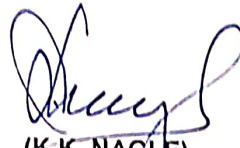

(M.R. PATIL)

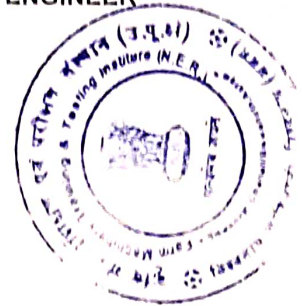
AGRICULTURAL ENGINEER



(J.P. MANDAL)

SENIOR AGRICULTURAL ENGINEER


(K.K. NAGLE)
DIRECTOR



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

12. APPLICANT'S COMMENTS

No comments received from the applicant.