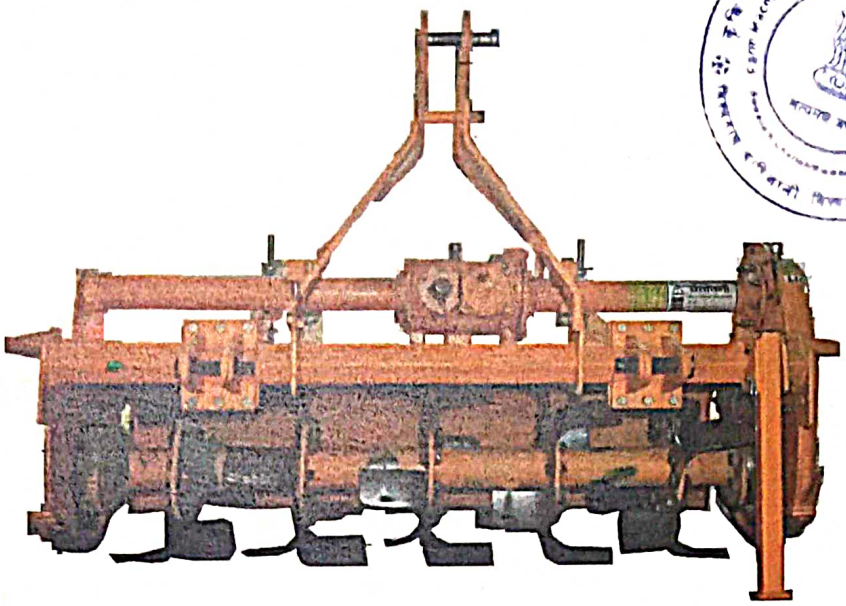
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT (Initial)

स्वच्छ भारत
एक कदम स्वच्छता की ओर

संख्या/No.: Imp. 307/392
माह / Month: March 2021

THIS TEST REPORT IS VALID UPTO 31.03.2028



SWAN AGRO ROTARY TILLER (ROTAVATOR), MODEL: NSML RTJT 125
MULTI SPEED, GEAR DRIVE, CENTRALLY MOUNTED

सत्यमेव जयते
भारत सरकार
GOVT OF INDIA
कृषि एवं किसान कल्याण मन्त्रालय
MINISTRY OF AGRICULTURE & FARMERS WELFARE
कृषि, सहकारिता एवं किसान कल्याण विभाग
DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान
NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE
विश्वनाथ चारिआलि, जिला-विश्वनाथ (असम)
BISWANATH CHARIALI: BISWANATH: ASSAM, PIN - 784 176
[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Website: http://nerfmtti.nic.in
Ph. No. 03715-222094
Fax No: 03715-230358
E-Mail: 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 OM No. 13-13/2020-M&T (I&P), dated 24.04.2020, the random selection was exempted by Govt. of India. 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 Recommendation 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, KoharaMachhiwara Road, Ludhiana, Punjab- 141112
Name & Address of Applicant	:	**M/S NEW SWAN MULTITECH LTD.** Vill. Raian, P.O, Heeran, KoharaMachhiwara Road, Ludhiana, Punjab- 141112
Name of machine	:	Rotary Tiller (Rotavator)
Type	:	Multi Speed, Gear Drive, Centrally Mounted,
Make	:	Swan Agro
Model	:	NSML RTJT 125
Year of manufacture	:	2020
Serial Number	:	47231
Recommended power source kW (apa)	:	20
Type of blade	:	Hatchet (L-Shaped)
Size (cm) {Rotor Dia.× Working width}	:	45.0 × 126.8

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 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

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 10.31 and 25.08 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-1
2	Engine speed (rpm)		
	- No load	1936 to 1946	1967 to 1974
	- On load	1907	1932 to 1936
3	Type of soil	Light	
4	Depth of standing water (cm)/ soil moisture (%)	10.40 to 10.60	10.5 to 11.5
5	Bulk density of soil (g/cc)	--	1.36 to 1.48
6	Speed of operation (kmph)	2.67 to 2.69	3.12 to 3.19
7	Travel reduction (%)/ Wheel slip (%)	0.60 to 0.99	-3.19 to -1.46
8	Depth of puddle (cm)/ Depth of cut (cm)	28.2	7.41 o 7.90
9	Working width (cm)	--	130 to 134
10	Area covered (ha/h)	0.333 to 0.347	0.359 to 0.374
11	Time required for one ha (h)	2.88 to 3.00	2.67 to 2.79
12	Puddling Index (%)/ Field efficiency (%)	75.7 to 82.0	86.51 to 89.35
13	Fuel consumption		
	- l/h	3.73 to 3.83	5.41 to 5.71
	- l/ha	--	14.93 to 15.51

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 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 7.67 cm which does not meet the requirement of Indian Standard.

11.4 The Max. PTO power required (kW) mentioned on the labeling plate of machine does not matched with the specification sheet. It should be looked into for corrective action.

11.5 Four rotor speed have been mentioned in the label on the machine, however two gears are provided in the primary reduction gear box. It should be looked into corrective action.

11.6 Chemical composition of rotor blades does not conform to IS: 6690-2002. The percentage of carbon and manganese content in composition of rotary tiller blade material was recorded as 0.297 and 1.282, respectively. The carbon content was on lower side and manganese content was on higher side when compared with the relevant Indian Standard. Moreover, the hardness of Shank & Edge portion of rotor blades also does not conform to relevant Indian Standard. It is therefore, recommended that the material of rotary tiller blade should be improved and shall be provided as per requirement of Indian Standard.

TESTING AUTHORITY

(S.G.PAWAR)
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

Para No	Our Reference	Applicants Comments
12.1	11.1	We will look into this for corrective action in further production.
12.2	11.2	We will look into this for corrective action in further production.
12.3	11.3	It may vary due to different soil condition or moisture. We will look this for corrective action in further production.
12.4	11.5	Four speed are optional as shown on label. Two speed are available at the time. If you want to get more variation then customer have to buy a different set of spur gear for different speeds.
12.5	11.6	We use the material Boron steel (27MnCrB5) for rotor blade manufacturing for better life of blade that's why the chemical composition of blades does not conforms to IS:6690:2002