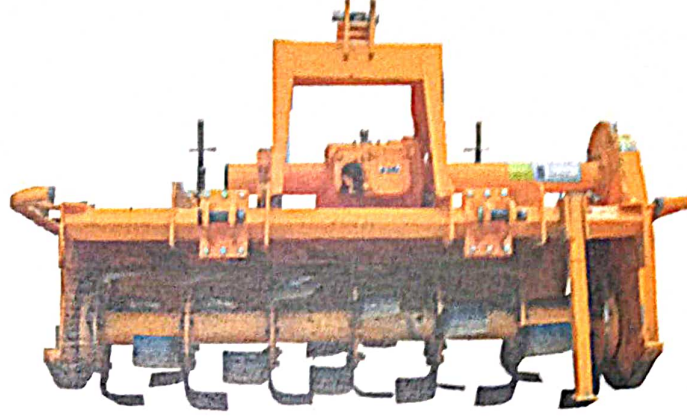


व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT (Initial)



संख्या/No.: Imp. 295/376
माह / Month: January 2021

THIS TEST REPORT IS VALID UPTO 31.01.2028



SWAN AGRO ROTARY TILLER (ROTAVATOR), MODEL: NSML RTST150
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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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 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, 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 RTST150
Year of manufacture : 2020
Serial Number : 46541
Recommended power source : 35 hp & above (As per Applicant)
Type of blade : Hatchet (L-Shaped)
Size (cm) {Rotor Dia.× Working width} : 45.0 × 151.0

4.2 Prime Movers Used:

Tractor : Mahindra & Mahindra DI 475 MKM
Chassis No./ Engine No. : MBNAAAJAARKRL03140/RKL2KAA0191
Max. PTO Power, kW : 27.9

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

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 10.33 and 26.41 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	1943	1971
	- On load	1904 to 1911	1929 to 1932
3	Type of soil	Light	
4	Depth of standing water (cm)/ soil moisture (%)	10.73	10.2 to 11.0
5	Bulk density of soil (g/cc)	--	1.30 to 1.54
6	Speed of operation (kmph)	2.70 to 2.83	3.05 to 3.23
7	Travel reduction (%) / Wheel slip (%)	1.49 to 3.10	-1.71 to -3.01
8	Depth of puddle (cm) / Depth of cut (cm)	26.6 to 32.6	8.53 to 8.80
9	Working width (cm)	--	154 to 157
10	Area covered (ha/h)	0.345 to 0.362	0.401 to 0.420
11	Time required for one ha (h)	2.75 to 2.89	2.38 to 2.49
12	Puddling Index (%) / Field efficiency (%)	78.0 to 81.3	83.0 to 85.41
13	Power requirement, kW	NR	22.6 to 23
14	Fuel consumption		
	- l/h	3.29 to 3.48	5.52 to 5.73
	- l/ha	--	13.42 to 14.27

7.1 Wet land operation :

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

vi	Year of manufacture		provided on rotary tiller (Rotavator)	--	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 In dry land operation, average depth of cut was recorded as 8.69 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 Power Input Connection (PIC) of implement does not conform to IS: 4931-1995 and it should be looked into for corrective action.
- 11.4 Specifications of hitch pyramid does not conform to IS: 4468-1997(Part-1) 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 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 on the lable (sticker) of 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. Pankaj Sethi,
Technical Assistant

12. APPLICANT'S COMMENTS

No comments received from the Applicant.