

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: MACHINE-12/2493/2020
माह/Month : August, 2020

THIS TEST REPORT VALID UP TO : 31st August, 2027



**ANADOLU, MARSHALL SP4R
PNEUMATIC MAIZE PLANTER (TRACTOR MOUNTED)**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

Northern Region Farm Machinery Training and Testing Institute

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[ISO 9001:2015 CERTIFIED]

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6.8.2 Fertilizer furrow opener:

Constituents	As per IS: 6690-1981		Composition As observed (% of weight)	Remarks
	Carbon Steel	Silicon Manganese Steel		
Carbon (C)	0.70-0.85	0.50 to 0.60	0.1694	Does not conform
Silicon (Si)	0.10-0.40	1.5 to 2.00	0.4161	Does not conform
Manganese (Mn)	0.50-1.0	0.50 to 1.0	0.7119	Conforms
Sulphur (S)	0.5(Max)	0.5(Max)	0.0543	Conforms
Phosphorous (P)	0.5(Max)	0.5(Max)	0.0206	Conforms

7. FIELD TEST

The field test of pneumatic planter Marshall SP4R was conducted with ACE-550 tractor with PM-10 variety of maize and DAP fertilizer. The duration of field test was 22.0 hours. The pto rpm was maintained at 410 rpm.

Sl. No.	Parameters	Range
1	Type of soil	Sandy loam
2	Soil moisture (%)	9.1 to 9.6
3	Gear used of tractor	L-4
4	Avg. speed of travel (km/h)	4.59 to 4.78
5	Avg. Wheel slip (%)	0.68 to 1.47
6	Variety of Maize crop	PM- 10
7	Avg. depth (cm)	
	- Seed	5.0 to 5.4
	- Fertilizer	2.5 to 2.8
8	Avg. seed spacing (cm)	18.0 to 18.6
9	Area covered (ha/h)	1.09 to 1.16
10	Time required for one ha (h)	0.86 to 0.92
11	Seed rate (number of seeds/ha)	78957 to 81295
	Missed seed (number of places/ ha.)	1403
	Doubling of seeds (number of places/ ha)	2105
	Deviation of seeds from the centre line	Nil
12	Fertilizer rate (kg/ha)	258.70 to 272.65
13	Field efficiency (%)	85.2 to 87.2
14	Avg. power requirement (kW)	2.82
16	Fuel consumption	
	l/h	2.73 to 3.10
	l/ha	2.41 to 2.72

7.1 Rate of work

- The average area covered was recorded as 1.09 to 1.165 ha/h at average operating speed 4.59 to 4.78 km/h
- The field efficiency of seed cum fertilizer drill was recorded as 85.2 to 87.2 %.



7.2 Quality of work

- The average depth of sowing the seed was recorded as 5.0 to 5.4 cm.
- The average depth of sowing the fertilizer was recorded as 2.5 to 2.8 cm.
- The average spacing between seeds was recorded as 18.0 to 18.6 cm.
- The average row spacing was 71.0 cm.
- The average number of seeds per five row length was recorded as 26 to 29
- The average number of missing seeds was recorded as 1403 places/ha
- The average number of doubling seeds was 2105 places/ha
- The deviation of seeds from the centre line was nil
- **The no. of seeds sown was recorded 78957 to 81295 per hectore.**
- **The fertilizer rate of was recorded 258.70 to 272.69 kg/ha.**

7.3 Power requirement: The average P.T.O power requirement during Maize sowing was 2.83 kW.

7.4 Rate of wear of furrow opener on mass basis (for 23.01 hours of field operation including running in):

Furrow opener No	Initial Mass (g)	Final Mass (g) after 23.01 h	Percent Wear (%)		
			Loss of mass (g) after 23.01 h	Percent (Wear)	Wear Per hour
Seed furrow opener					
1	4500	4460	40.0	0.89	0.04
2	4580	4520	60.0	1.31	0.06
3	4560	4520	40.0	0.88	0.04
4	4580	4540	40.0	0.87	0.04
Fertilizer furrow opener					
1	3220	3190	30	0.93	0.04
2	3100	3080	20	0.65	0.03
3	2700	2680	20	0.74	0.03
4	3120	3100	20	0.64	0.03

Remark: The hourly rate of wear on mass basis was observed as 0.03 to 0.06 %.

7.5 Labour requirement

One skilled operator was required to operate the tractor and one more labor is needed for filling the seed and fertilizer box, to check the furrow openers and seed tubes against chocking.



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8. EASE OF OPERATION AND ADJUSTMENT

No noticeable difficulty was observed during operation and adjustment of Maize Pneumatic planter

9. DEFECTS, BREAKDOWNS, AND REPAIRS

No noticeable defect occurred in the Maize pneumatic planter during the test

10. CONFORMITY TO INDIAN STANDARDS

Cl. No	Requirement as per IS: 6813: 2000	Observations	Remarks	
Cl 4	Type	Tractor mounted	--	
Cl 5.1	Size	4 x 710 mm (Adjustable)	--	
Cl 6.1	Material: -			
	Component Requirement			
Sl. No.	Component	Material specified in Indian standard	Observations	Remarks
1.	2.	3.	4.	5.
1.	Frame & tool bar	Mild steel	Mild steel	Conforms
2.	Wheel	Mild steel, Cast iron, Pneumatic tyre	Pneumatic tyre	Conforms
3.	Axle & Shaft	Mild steel	Mild steel	Conforms
4.	Seed & fertilizer boxes	Mild steel, Galvanised iron sheet, Seasoned wood , Plastic, fibre reinforced plastic	Plastic	Conforms
5.	Tines	Mild steel, Carbon steel	Not Available in this design	Not Applicable
6.	Boot	Mild steel, Cast iron	Not Available in this design	Not Applicable
7.	Furrow opener	High carbon steel	High carbon steel	Conforms
8.	Seed agitator	Mild steel, Cast iron, Aluminium, PVC, Rubber, Canvas	Not Available in this design	Not Applicable
9.	Fertilizer agitator	Mild steel, Cast iron, Aluminium, Canvas	Aluminium	Conforms
10.	Seed & Fertilizer tubes	Steel ribbon, Plastic, Rubber	Polyurethane	-
11	Seed metering mechanism	-	Pneumatic	-

13.	Fertilizer metering mechanism			
a.	Fertilizer feed roller, Fertilizer feed cut off and plate	Cast iron, Mild steel, Nylon, Cast aluminium	Nylon	Conforms
b.	Retaining ring and cover	Brass, HD PVC, Nylon	Not Available in this design	Not Applicable
c.	Feed cup	Cast iron, HD PVC, Nylon	Nylon	conforms

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CI 12	WORKMANSHIP & FINISH		
CI 12.1	The welding shall be satisfactory in all aspects and should not be brittle.	Satisfactory	Conforms
CI 12.2	The components shall be free from rust and shall have a protective coating to prevent surface deterioration in transit and storage.	The components are free from rust and have a protective coating to prevent surface deterioration in transit and storage.	Conforms
CI 12.3	The components should be free from pits, burrs and other defects that may be detrimental for their use.	The components are free from pits, burrs and other defects.	Conforms
CI 14	MARKING & PACKING:		
CI 14.1	Each drill shall be marked with the following particulars: a) Indication of the source of Manufacture b) Model, code and serial number c) Type d) Size e) Type of seeds (suitability) f) Mass	Sticker is provided. But not containing all the required information.	Does not conform in toto

11. Critical Technical Specification

Deferred till 31.12.2020 vide Ministry O.M. No 13-13/2020 M&T, (I&P) dated 24.04.2020

12. COMMENTS AND RECOMMENDATIONS

- 12.1 Dimension of three point linkage of the machine does not conform to the requirements of IS 4468 -1997 in toto. This may be looked into.
- 12.2 Dimension of power input shaft and propeller shaft hub do not conform to the requirements of IS 4931:1995, in toto. This may be looked into for necessary action.
- 12.3 A proper labelling plate and calibration plate should be provided on the machine
- 12.4 The variation in dropping of seed among different furrow openers was observed to be on higher side and therefore needs to be looked into for improvement in the design.
- 12.5 The variation in dropping due to box filling at $\frac{3}{4}$ th, $\frac{1}{2}$ nd and $\frac{1}{4}$ th of rated capacity is on higher side and therefore needs to be looked into for improvement in the design.
- 12.6 The variation in the quantity of seed dropping due to change in the speed is on higher side and therefore needs to be looked into for improvement in the design.



12.7 The labeling plate should be provided with followings information.

- a) Indication of the source of Manufacture
- b) Model, code and serial number
- c) Type
- d) Size
- e) Type of seeds (suitability)
- f) Mass



12.8 **Literature**

Following literature has been provided by the applicant for reference during the test.

- i. Technical specification
- ii. User's manual
- iii. Parts catalogue

However, the User's manual needs to be updated as per IS: 8132-1999

TESTING AUTHORITY

RINKU PRASAD GUPTA TECHNICAL ASSISTANT	
P. K. PANDEY DIRECTOR	

Test report compiled by C.Veeranjaneyulu, Senior Technician.

13. **APPLICANT'S COMMENTS**

No specific comments received from applicant.

