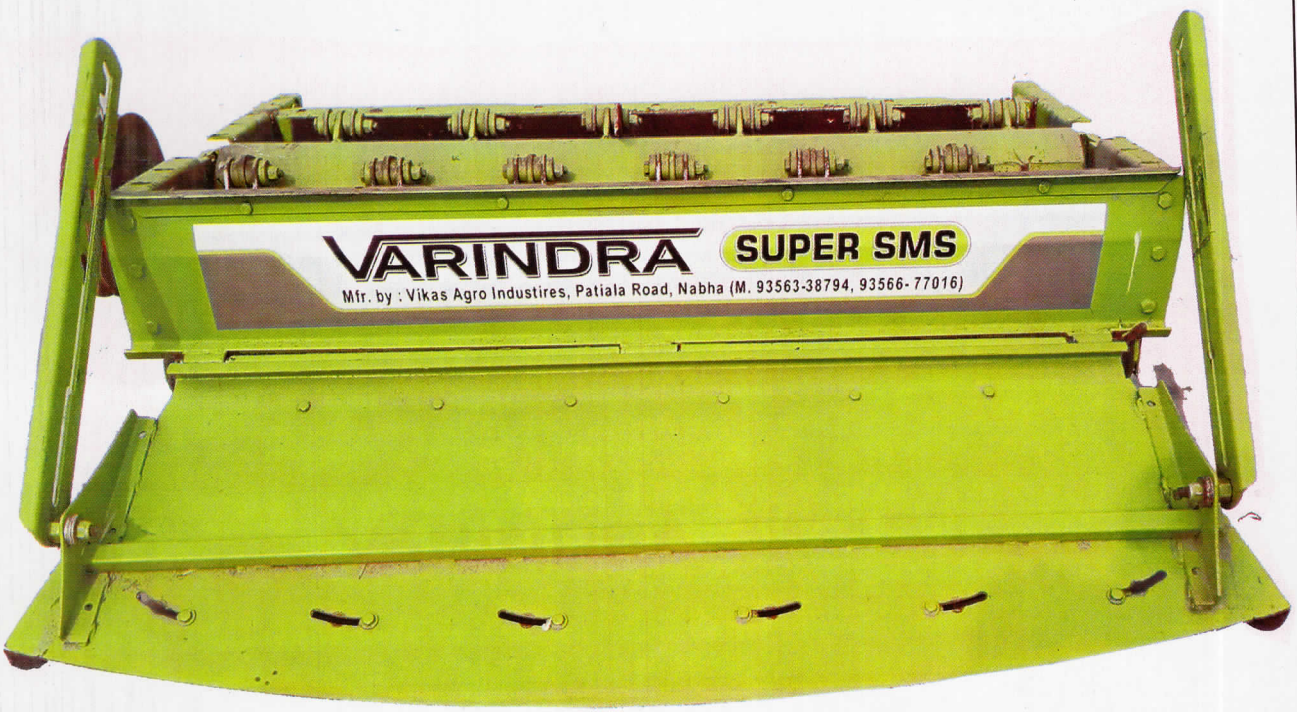
व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ **No.: COMP-173/2412/2019**
माह/**Month : December, 2019**

THIS TEST REPORT VALID UP TO : 31st DECEMBER, 2026



VARINDRA SUPER SMS, FITTED ON CHARAN-732 SELF PROPELLED COMBINE HARVESTER

सत्यमेव जयते

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
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4. ROTOR BALANCNING TEST

	Date of test	:	11.12.2019
	Make and model of Rotor balancing machine	:	PROTEQ and H – 1 K
	Mass of the job (kg)	:	82.52
	Service speed of the job rpm	:	1670
	ISO balancing grade	:	G 16
	Balancing speed rpm	:	1670

S.No.	**Particulars**	As permissible	As observed	Remark
	Unbalance weight (Left side plane) (g)	45.77	9.6	Balanced
	Unbalance weight (Right side plane) (g)	45.77	22.91	Balanced

	Unbalance angle (**Left side plane**) (degree)	128.21
	Unbalance angle (**Right side plane**) (degree)	216.22

5. FIELD PERFORMANCE TEST

5.1 The SMS fitted on Charan-732 combine harvester was operation in the paddy field for 5.70 hrs, to assess (a) performance of SMS and, (b) performance of combine harvester with SMS.

The crop parameters recorded during the test were as under:-

Crop Parameters

Sl. No.	**Parameters**		**Observations**
1.	Average plant height, cm	:	100 to 110
2.	Average number of tillers/m^2	:	305 to 352
3.	Average length of ear head, cm	:	21 to 27
4.	Average straw/grain ratio	:	3.2:1
5.	Average moisture, %		
	- Grain	:	15.5
	- Straw	:	65.4

The results of field performance test of paddy crop harvesting are summarised in Table and presented in detail in **Appendix – II to V.**

Table: SUMMARY OF LOSSES & EFFICIENCIES OBSERVED DURING FIELD PERFORMANCE TEST.

Crop variety	Collectable losses (%)	Non-collectable losses (%)	Total processing losses (%)	Threshing efficiency (%)	Cleaning efficiency (%)	Grain breakage in main grain tank (%)	Forward speed (kmph)	Area covered (ha/h)	Fuel consumption		Grain output (kg/h)	Crop throughput (t/h)
									(l/h)	(l/ha)		
1	2	3	4	5	6	7	8	9	10	11	12	13
PADDY												
Pusa 1121	2.4	0.6	2.5	98.9	96.7	1.36	1.38	0.350	8.75	25.0	1780.17	7.56

SUMMARY OF FIELD PERFORMANCE OF SMS

Uniformity of straw spread, CV, (percent)	18.1
Weighted mean size of chopped straw, cm	8.7

6. DEFECTS, ADJUSTMENTS, BREAKDOWNS AND REPAIRS

No noticeable defect observed

7. SUMMARY OF OBSERVATIONS

7.1 Field test

7.1.1	**Performance of SMS with Charan-732 Combine Harvester**	
1	Uniformity of straw spread, CV, (percent)	18.1
2	Weighted mean size of chopped strew, cm	8.7

7.1.2 The performance of Charan-732 combine harvester with Varindra Super SMS

S. No	Parameters	Observations
1.	Speed of operation (kmph)	1.38
2.	Area covered (ha/h)	0.350
3.	Fuel consumption: - (l/h) - (l/ha)	 8.75 25.0
4.	Crop throughput (tonne/h)	7.56
5.	Grain breakage in main grain outlet (%)	1.36
6.	Header losses (%)	0.51
7.	Total non-collectable losses (%)	0.6

	vi)	Break down (critical, major & minor)			
Sr. No.	Category of breakdowns	Category (Evaluative/ Non evaluative)	Requirements as per IS 15806:2018	As observed	Whether meets the requirements (Yes/No)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two	None	Yes
4.	Total breakdown	Evaluative	In no case total no of (major + minor) breakdowns exceed five	None	Yes

9. CRITICAL TECHNICAL SPECIFICATIONS

(Vide Ministry's communication F. No 9-1/2019- M&T (I&P) dated 20.08.2019)

Sl No.	Parameters	Specification	Observation	Remarks
Rotor				
1.	Rotor diameter, mm	165-170	165	Conforms
2.	No. Of lugs on rotor in row	6	6	Conforms
3.	No. Of rows in periphery	4	4	Conforms
4.	Length of pivotal flail, mm	170-180	180	Conforms
5.	Width of flail, mm	50 ± 1	50	Conforms
6.	Thickness of flail, mm	5.0 (Min.)	5.0	Conforms
7.	No of flails in one set	2	2	Conforms
8.	Spacing between flails of one set, mm	35 (Max)	39.0	**Does not conform**
9.	Distance between adjacent flails units, mm	200±10	203	Conforms
10.	No of rows/bars of serrated blades	1	1	Conforms
11.	No of serrated blades in row	20 (Min.)	24	Conforms
12.	Spacing between serrated blades, mm	50 (Max.)	50	Conforms
13.	Overlapping of pivotal blade on serrated blade, mm	60 (Min.) (adjustable)	92	Conforms
Spreader				
14.	Total no of flaps	6 + 2 (side)	6+2	Conforms
15.	Length of flaps, cm	38 (Min.)	36.5	**Does not conform**
16.	Distance between flaps (left to right)	Adjustable	Adjustable	Conforms

17.	Spreader angle with horizontal, degree	Adjustable preferably downwards	Adjustable	Conforms
18.	Spreader angle with line of travel, degree	15 (Min.) (adjustable)	27° (Max.)	Conforms
19.	Spreader sheet thickness, mm	2.5-3.0	3.0	Conforms
20.	SMS sheet thickness, mm	5.0 (Min.) for outer	5.0	Conforms
21.	Rotor balancing	Should be dynamically balanced	Balanced	Conforms
22.	Rotor rpm	Min. 1600	1670	Conforms
23.	Fitting of SMS on combine harvester	Rigidly fixed to the combine chassis	Rigidly fixed	Conforms
24.	Fitting of power transmission system on combine harvester	Rigidly fixed to the combine chassis	Rigidly fixed	Conforms
25.	Marking/labelling of machine	Labelling plate should be riveted on the body of machine having Name and address of manufacturer, Country of origin Make Model Year of manufacturer, Serial number, Type Size required size of prime mover (kW), Weight of the machine (Kgs)	Provided	Conforms
26.	Literature	Operator manual, Service manual and Parts catalogue should be provided	Provided, but only for name sake	Conforms

10. COMMENTS AND RECOMMENDATIONS

10.1 **Field performance test**

No noticeable defect observed during field test.

10.2 Spacing between flails of one set blade **does not meet the requirement of critical technical specification. It must be looked into.**

10.3 Length of flap **does not meet the requirement of critical technical specification. It must be looked into.**

10.4 Applicant has recommended Charan -732 combine harvester for SMS field testing. This is vital information and therefore the same must be inscribed in labelling plate also for the guidance of users.

10.5 In the labelling plate, the power requirement is given as 74.3 kW, whereas the power of the combine harvester recommended is 70.95 kW. **This is misleading and therefore Must be looked into for corrective action.**

10.6 In the labelling plate manufacture has declared the weight of SMS as 296 kg, which is misleading. The actual weight was observed as 215 kg. It may be looked into.

Ease of operation and safety provision

No noticeable difficulties observed during operation of SMS.

10.7 **Hardness**

The harness of fixed & flail blade of SMS does not conforms to the requirement of IS 15806:2018. It MUST be looked into as it is evaluative requirement

10.8 Material of SMS blade is not specified. It should be specified.

10.9 Literature supplied with the machine

1) There was one document entitle "Operator manual and Service manual" was supplied. However, it could be anything but the operator manual, as it lacks the relevant information on operation, adjustments and safety etc.
2) There was another document entitle "Super SMS parts catalogue". This too, does not qualify to be parts catalogue for the want of numbering/indexing the various parts/components of the SMS.

Therefore the Operator manual/ Service manual/ Parts catalogue need to be brought out as per IS 8132: 1999.

TESTING AUTHORITY

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY **DIRECTOR**	

Test report compiled by C.Veeranjaneyulu, Senior Technician

11. APPLICANT'S COMMENTS

We will take corrective action in our future product.