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



संख्या/No.: Machine 121/492
माह / Month: May 2024

THIS TEST REPORT IS VALID UPTO 31.05.2031



SECHANAM AISPR-40 SELF PROPELLED REAPER



भारत सरकार

GOVERNMENT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

कृषि एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE AND FARMERS WELFARE

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NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

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Machine 121/492	SECHANAM AISPR-40 SELF PROPELLED REAPER	COMMERCIAL (INITIAL)
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1. SCOPE OF TEST

The scope of test was limited to check and assess the following:

- 1.1 Specifications and other data furnished by the applicant
- 1.2 Engine Performance
- 1.3 Vibration measurement
- 1.4 Noise measurement
- 1.5 Air cleaner oil pull over
- 1.6 Wear analysis of critical components (Cutter Bar knife section)
- 1.7 Hardness and chemical analysis (Cutter Bar knife section)
- 1.8 Field performance
- 1.9 Ease of operation and adjustments
- 1.10 Defects, breakdowns and repair

2. METHOD OF SELECTION

The test sample was selected by the testing authority through random selection. The following test samples were presented by the applicant during the random selection at applicant's site.

Sl. No.	Serial No. of test sample	Remarks
1	AISPR 3141	Out of 5 samples, Sl. No. 4 sample was randomly selected.
2	AISPR 3142	
3	AISPR 3143	
4	AISPR 3144	
5	AISPR 3145	



3. TEST CODE/PROCEDURE

There is no Indian Standard Test Code available for testing of reaper as such. The guidelines, however, have been taken from the following:

1. IS: 11467:1985 (Reaffirmed 2012) : Test code for cereal harvesting machines.
2. IS: 6025:1982 (Reaffirmed 1999) : Specification for knife sections for harvesting machine.
3. IS: 10378:1982 (Reaffirmed 2001) : Specification for knife back for harvesting machine.
4. IS: 7347:1974 (Amended 2011) : Specification for Performance of Small Size Spark Ignition Engines.

4. SPECIFICATIONS

4.1 General:

- Name and address of the manufacturer : **Chongqing Senci Wugu Agriculture Machinery Import and Export Company Limited, Longfei Road, Dongchen Street, Tongliang District, Chongqing- 402 560, CHINA**
- Name & address of applicant : **Aquatix India, Madan Mohan Lane,**

1646/B, Near Binayak Steel, Gosala Road,
Cuttack-753004, Odisha

Name of the machine : Reaper
 Type : Self Propelled, Walk behind
 Make : SECHANAM
 Model : AISPR-40
 Year of manufacture : 2023
 Serial Number : AISPR 3144
 Country of origin : CHINA
 Size of reaper (mm) : 1170
 Name of crop recommended by applicant : Paddy
 Name of crop in which the test was conducted : Paddy

**4.2 Details of Prime Mover Used:**

Name and address of the manufacturer : **Chongqing Senci Wugu Agriculture Machinery Import and Export Company Limited, Longfei Road, Dongchen Street, Tongliang District, Chongqing-402 560, CHINA**

Make : Not Specified
 Model : FM70
 Type : 4-Stroke, Petrol Engine, Single cylinder, Air cooled
 Year of manufacture : 2023
 Serial Number : 2107017
 Country of origin : CHINA
 Recommended high idle speed (rpm) : 3800 ± 100 (at engine)
 Recommended low idle speed (rpm) : 1750(±100) (at engine)
 Recommended rated speed (rpm) : 3600 (at engine)
 1800 (at PTO)
 Recommended speed for field test (rpm) : 3600 (at engine)
 1800 (at PTO)
 Rated power observed (kW) : 2.41
 Rated power declared (kW) : 4.49

Machine 121/492	SECHANAM AISPR-40 SELF PROPELLED REAPER	COMMERCIAL (INITIAL)
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Sl. No.	Hardness				Remarks	
	As per IS: 6025-1982		As observed		Hardened Zone	Remainder Zone
	Hardened Zone	Remainder Zone	Hardened Zone	Remainder Zone		
1	48-58 (HRC)	20-35 (HRC)	55.8 (HRC)	87.0 (HRBW)	Conforms	Does not Conform

11.3 Chemical composition of Knife section (Movable):

The material of reaper knife section was got analyzed for chemical composition. The results of chemical analysis test are as under:

Constituents	As per IS: 6025-1982	Composition as observed (% by weight)	Remarks
Carbon (C)	0.70 -0.95	0.593	Does not Conform
Manganese (Mn)	0.3 – 0.50	0.971	Does not Conform

11.4 Chemical composition of Knife section (Stationery):

The material of reaper knife section was got analyzed for chemical composition. The results of chemical analysis test are as under:

Constituents	As per IS: 6025-1982	Composition as observed (% by weight)	Remarks
Carbon (C)	0.70 -0.95	0.582	Does not Conform
Manganese (Mn)	0.3 – 0.50	0.975	Does not Conform

12. FIELD PERFORMANCE TEST

The machine was tested for total of 26.17 hours during harvesting Paddy crop. The performance of the machine was assessed with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction. The detailed test results have been given in Annexure-I & II and summarized in Table 1 & 2 below.



SUMMARY OF CROP PARAMETERS

Table-1

Sl. No.	Parameters	Range
1	Variety of crop	Ranjeet / Joha
2	Straw moisture content (%)	29.8 to 36.4
3	Grain moisture content (%)	14.5 to 17.7
4	Plant height (cm)	86.4 to 118.0
5	Length of ear head (mm)	149.0 to 202.0
6	Number of grains per ear head	87 to 169
7	Number of hills per square meter	15 to 29
8	Number of tillers per hill	12 to 21
9	Straw-grain ratio	1.11:1 to 2.62:1

SUMMARY OF FIELD PERFORMANCE TEST

Table-2

Sl. No.	Parameters	Range
1	Forward speed (kmph)	2.94 to 3.02
2	Width of cut (cm)	116 to 118
3	Stubble height (mm)	158 to 192
4	Losses (Percentage of total grain yield)	
	-Pre-harvest loss	0.000 to 0.001
	-Post harvest loss (Cutter bar)	0.02 to 0.06
	-Conveyor loss	0.03 to 0.08
5	Area harvested (ha/h)	0.230 to 0.262
6	Field efficiency (%)	66.47 to 72.22
7	Time required for one hectare (h)	3.82 to 4.35
8	Fuel consumption	
	- l/h	0.77 to 0.83
	- l/ha	3.11 to 3.60

12.1 Rate of work

- The forward speed of machine was observed as 2.94 to 3.02 kmph.
- The area harvested by the machine was recorded as 0.230 to 0.262 ha/h.

12.2 Quality of work

- Field efficiency was observed as 66.47 to 72.22%.
- The post-harvest loss (cutter bar) was observed as 0.02 to 0.06% of total grain yield.
- The conveyor loss was observed as 0.03 to 0.08% of total grain yield.
- The stubble height was recorded as 158 to 192 mm.
- Machine leaves the harvested crop in windrows.



16.COMMENTS AND RECOMMENDATIONS

- 16.1 Rated power of the engine was observed as 2.41 kW against declared value of 4.49 kW by the applicant/manufacturer. This should be looked into for corrective action.
- 16.2 The specific fuel consumption (SFC) corresponding to rated power of engine was observed as 394.7 g/kWh against declared value of 370 g/kWh by the applicant/manufacturer which exceeded by more than 5 percent of that declared by the manufacture and does not fulfill the requirement of IS 7347-1974 (reaffirmed 2006). This should be looked into for corrective action.
- 16.3 During field performance test, it was observed that welding of cutter bar height adjustment bracket holder and welding at wheel axle coupling were broken. This should be looked into for improvement in welding quality.
- 16.4 The amplitude of mechanical vibration marked as (*) was on drastically higher side and is directly concerned with operator's health, safety and comfort. Besides, it also adversely affects the useful life of machine components. In view of above, this deserves to be given top priority for corrective action.
- 16.5 Noise at operator's ear level was observed on higher side against danger limit of 90 dB(A) as specified by ILO for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve operator's comfort and safety.
- 16.6 Specifications of knife section of the cutter bar does not conform to IS 6025:1982 (Reaffirmed 1999) and it should be looked into for corrective action.
- 16.7 Specifications of knife section back of the machine does not conform to IS 10378-1982 (Reaffirmed 2001) and it should be looked into for corrective action.
- 16.8 The hardness and chemical composition of knife sections (both movable and stationary) does not conform to the requirement of IS 6025-1982 (Reaffirmed 1999). It should be looked into for improvement.



16.9 Technical literature:

Operator cum Service Manual & Parts Catalogue was provided along with the machine during the course of testing. It is further recommended to bring out these manuals in Hindi and other vernacular languages as per IS: 8132-1999.

TESTING AUTHORITY


(M.R. PATIL)
AGRICULTURAL ENGINEER



(DR. P.P. RAO)
DIRECTOR

Draft test report compiled by - Shri. J. Bhon Singh, STA

17. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comments
17.1	16.1 to 16.9	We will take necessary action as per comments and recommendations in the test report for improvement in future production.

