

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



संख्या/No.: Machine 119/490
माह / Month: March 2024

THIS TEST REPORT IS VALID UPTO 31.03.2031



SECHANAM AIPHD-40 POST HOLE DIGGER



भारत सरकार
GOVT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय

MINISTRY OF AGRICULTURE & 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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1. SCOPE OF TEST

1.1 LABORATORY TEST

- Checking of specifications
- Mechanical vibration measurement
- Noise measurement
- Hardness & Chemical Analysis
- Wear assessment of critical components
- Engine performance test

1.2 FIELD TEST

- Rate of work
- Quality of work
- Labour requirement
- Adequacy of prime mover power
- Ease of operation, adjustment & safety provisions
- Defects, breakdowns and repairs



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	Sl. No	Serial No. of test sample	Remarks
1	AIPHD2934	6	AIPHD2941	Out of 10 samples, Sr. No. 04 sample was randomly selected.
2	AIPHD2939	7	AIPHD2947	
3	AIPHD2952	8	AIPHD2954	
4	AIPHD2938	9	AIPHD2943	
5	AIPHD2933	10	AIPHD2940	

3. TEST CODE AND PROCEDURE

There is no Indian Standard Test Code available for testing of Post hole digger as such. However, for engine performance test, IS 7347-1974 (Amended 2011) was referred.

4. SPECIFICATIONS

4.1 General

Name of the Machine : Post Hole Digger

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Name and address of the manufacturer : Ningbo Aosheng Machine Co., Ltd.,
Linshan Industrial Park, Yuyao City,
Zhejiang Province, China

Name & Address of Applicant : Aquatix India, Madan Mohan
Lane,1646/B, Near Binayak Steel,
Gosala Road, Cuttack-753004, Odisha

Model : AIPHD-40

Make : SECHANAM

Serial No. : AIPHD2938

Type : Engine powered, manually held

Year of manufacture : 2023

Country of origin : CHINA

Recommended use (apa) : Digging holes for plantation

4.2 Constructional details:

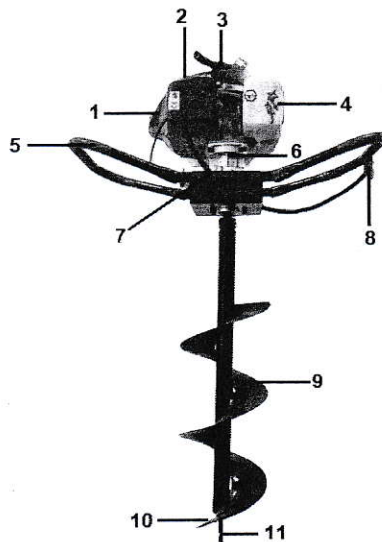


Fig. 1: SECHANAM POST HOLE DIGGER, MODEL: AIPHD-40

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10.4.3 Chemical composition of Auger Bit

The results of chemical analysis test of Auger Bit

Constituents	As per IS: 6025 – 1982 (%)	Composition As observed (% by weight)	Remarks
Carbon (C)	0.70 to 0.95	0.485	Does not conform
Manganese (Mn)	0.3 to 0.5	0.593	Does not conform
Silicon (Si)	-----	0.243	--
Sulphur (S)	-----	0.007	--
Phosphorous (P)	-----	0.020	--



11. WEAR ANALYSIS OF CRITICAL COMPONENTS

Critical Component- Auger:

Auger size	Duration of operation (h)	Initial mass (g)	Mass after operation (g)	Loss of mass (g)	Percentage of wear	Percentage of wear on hourly basis
100 mm	5.66	1700.0	1675.5	24.5	1.44	0.25
200 mm	16.95	3005.0	2950.0	55.0	1.83	0.11
250 mm	4.59	3950.0	3904.3	45.7	1.16	0.25

12. FIELD PERFORMANCE TEST

Field tests were conducted for 27.20 hours duration with auger attachments of size 100, 200 and 250 mm. A total of seven test trials were conducted at rated speed of 6500 rpm. Detailed results of field tests are shown in ANNEXURE and summarized in the ensuing table.

SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameters	Observations	
1	Size of Auger (mm)	100, 200 and 250	
2	Avg. Bulk density (g/cc)	158 to 163	
3	Avg. soil moisture (%)	9.5 to 13.0	
4	Avg. dia. of hole (mm)	110.6 to 260.0	
5	Avg. depth of hole (mm)	439 to 474	
6	Avg. no. of holes drilled per hour	67 to 240	
7	Time required for one hole (sec)	13.73 to 42.2	
8	Fuel consumption		
		-l/h	1.02 to 1.24
		-l/hole	0.004 to 0.017

12.1.1 Rate of work

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- Diameter of hole was recorded as 110.6 to 260.0 mm.
- Depth of hole was recorded as 439 to 474 mm.
- Number of holes drilled per hour was recorded as 67 to 240.
- Time required for making one hole was recorded as 13.73 to 42.2 sec.

12.1.2 Fuel consumption

- Fuel consumption was observed as 1.02 to 1.24 l/h and 0.004 to 0.017 l/hole.

12.3 Labour/operator requirement:

It was observed that two averagely built person can able to operate the Post Hole digger for 25 to 30 minutes at a stretch. Hence, four operators are required for continuous operation.

12.4 Adequacy of power of prime mover :

The power of prime mover was found adequate.

13. EASE OF OPERATION AND ADJUSTMENTS

Fatigue was observed in operators just after half an hour of operation of post hole digger due to excessive mechanical vibration and noise of the machine. The operator feels pain in different body parts like shoulders, back and fingers of hands during the operation.

14. DEFECTS, BREAKDOWNS AND REPAIRS

No noticeable defect or breakdown was observed during test.

15. COMPONENTS/ASSEMBLY INSPECTION

The Engine was dismantled after 37.12 hours of operation.

15.1 Engine:

15.1.1 Cylinder bore:

Cylinder bore dia. (mm)						Max. permissible wear limit (mm)
Top position		Middle position		Bottom position		
Thrust side	Non-thrust side	Thrust side	Non-thrust side	Thrust side	Non-thrust side	
NR						NA



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16. COMMENTS & RECOMMENDATIONS

- 16.1** The average rated power in rating test of engine was observed as 0.68 kW against declared value of 1.8 kW by the applicant/manufacturer. This should be looked into for corrective action.
- 16.2** The specific fuel consumption (SFC) in rating test of engine was observed as 1382.3 g/kWh against declared value of 280 g/kWh by the manufacturer which exceeded by more than 5 percent of that declared by the manufacturer and hence does not fulfill the requirement of IS 7347-1974 (Amended 2011). This should be looked into for corrective action.
- 16.3** The engine was not marked with Manufacturer name or trade-mark, Rated power, Rated speed and type of fuel used which does not fulfill the requirement of IS 7347-1974 (Amended 2011). This may be looked into.
- 16.4** Noise at operator's ear level was observed on much higher side against danger limit of 90 dB(A) as specified by International Labour Organization (ILO) for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operational comfort and safety.
- 16.5** 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 is also adversely affect the useful life of machine components. In view of above, this deserves to be given top priority for corrective action.
- 16.6** The Hardness & Chemical composition of Auger blade, Auger & Auger Bit does not conform to Indian Standard IS: 6690 – 1981 (Reaffirmed 2012) & IS 6025:1982. This should be looked into for improvement.
- 16.7** During field performance test it was observed that engine exhaust emissions were directly coming on operator's face. This shall be looked into for corrective action.
- 16.8** As the machine is imported, country of origin shall be mentioned on the labelling sticker.
- 16.9** **As a safety wear, protective cloth, ear plug and mask were not provided. The applicant has strictly advised to provide all the safety wears along with each machine for the safety of operator.**



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16.10 Adequacy of Literature

The following literature in English language was provided for reference during testing:

- Operator's/ Service manual
- Parts catalogue

It is recommended to bring out the manual in Hindi and other vernacular languages as per IS: 8132-1999.

TESTING AUTHORITY

(M. R. PATIL)
AGRICULTURALENGINEER

(Dr. P.P. RAO)
DIRECTOR

Draft test report compiled by - **Shri Khagendra Bora**
Sr. Technical Assistant

17. APPLICANT'S COMMENTS

Para No	Our Reference	Applicant's Comments
17.1	16.1 to 16.10	As per comments and recommendations necessary precautionary measures will be taken during future products.

