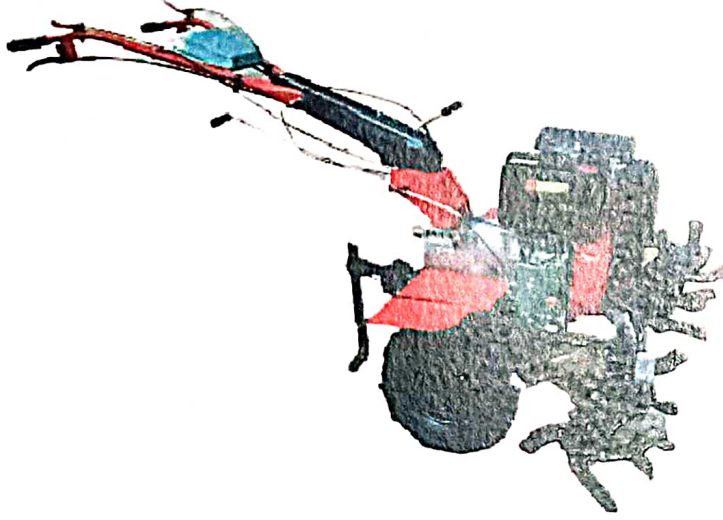




THIS TEST REPORT IS VALID UPTO 29.02.2028



**INDOXEN 108 A R AGRO EQUIPMENTS
POWER WEEDER**



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

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

विश्वनाथ चारिआलि, जिला- शोणितपुर (असम)

BISWANATH CHARIALI: SONITPUR: ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Machine 86/457	INDOXEN 108 A R AGRO EQUIPMENTS POWER WEEDER	COMMERCIAL (INITIAL)
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1. SCOPE OF TEST

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

- 1.1 Specification 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 Hardness & chemical composition
- 1.7 Field performance
- 1.8 Wear analysis of rotor blades
- 1.9 Ease of operation and adjustments
- 1.10 Defects, breakdowns and repairs

2. METHOD OF SELECTION

As per Govt. of India, OM No. 13-1/2021-M&T (I&P), dated 03.02.2022, the selection of sample for test was exempted. Hence, the machine was directly submitted by the applicant at this Institute for test.

3. TEST CODE AND PROCEDURE

There is no Indian standard/test code available for testing of self-propelled power weeder as such. The guidelines, however, have been taken from the following:

- | | |
|----------------------------------|---|
| IS 9935 : 2002 (Reaffirmed 2012) | : Power Tiller - Test code |
| IS 9980 : 1999 (Reaffirmed 2004) | : Guidelines for field performance and haulage tests of power tillers |
| IS: 12036:1995 (Reaffirmed 2004) | : Agricultural Tractors- Test procedure-Power Tests for Power Take-Off. |
| IS 1976 : 1976 (Reaffirmed 2009) | : Specification for Rotary paddy weeder, manually operated |
| IS 6690 : 1981 (Reaffirmed 2012) | : Specification for Blades for Rotavator for Power Tillers |

4. SPECIFICATION

4.1 General:

- | | |
|----------------------------------|--|
| Make | : A R AGRO EQUIPMENTS |
| Model | : INDOXEN 108 |
| Name and address of manufacturer | : Chongqing Guanteng Machinery Co. Ltd.
High-Tech Industrial Zone, Done, Dazu
District, Chongqing, China |

Name and address of applicant : A R AGRO EQUIPMENTS 45/1149,
Near Cheruvannur High School,
Kolathara, Po, Kozhikode, Kerala,
673655

Name of machine : Power Weeder

Type of machine : Self propelled, Walk behind

Working size of machine (mm) : 1120

Year of manufacture : 2021

Serial no. of machine : Not Specified

4.2 Details of prime mover:

Make : Not Specified

Model : 186 FA DHJD15A

Type : 4 stroke, Single cylinder, Air cooled

Year of manufacture : 2021

Serial Number : Not Specified

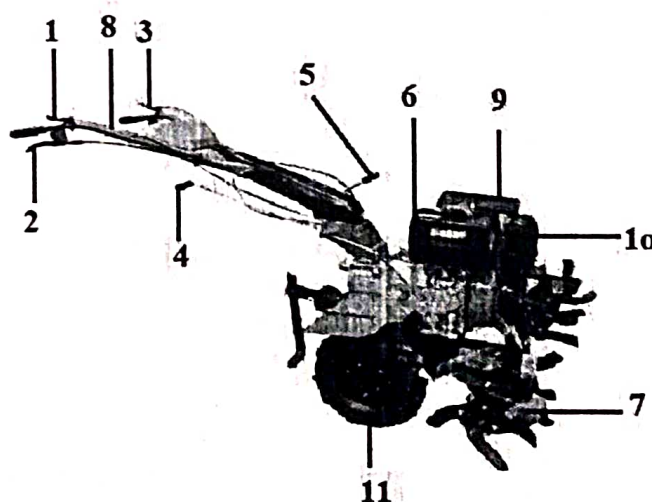
Country of origin : CHINA

Recommended high idle speed (rpm) : 3250 ± 100

Recommended low idle speed (rpm) : 1000 ± 200

Recommended rated speed (rpm) : 3000

Maximum power observed (kW) : 6.44

**Fig.1 A R AGRO EQUIPMENTS POWER WEEDER MODEL: INDOXEN 108**

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10. AIR CLEANER OIL PULL OVER TEST



Date of test : 27.09.2022
 Range of atmospheric conditions :
 Temperature (°C) : 30.1 to 31.9
 Pressure (kPa) : 100.1 to 100.3
 Relative humidity (%) : 58.2 to 62.7
 Mass of oil before test (g) : 73.03

Sl. No.	Position of Paddy reaper	Loss of oil (g)	Oil pullover (%)
1	Parked on level ground	6.9	9.45
2	Tilted to 15° laterally with RHS up	25.16	34.45
3	Tilted to 15° laterally with LHS up	5.66	7.75
4	Tilted to 15° longitudinally with front end up	21.86	29.93
5	Tilted to 15° longitudinally with rear end up	18.76	25.68

11. LABORATORY TEST

11.1 Hardness of rotor blades :

The surface hardness of blade was recorded as under :

	As per IS 6690:1981 (Reaffirmed 2012)	As observed (HRC)	Remarks
At edge portion	56 ±3 HRC	46.7	Does not conform
At shank portion	37 to 45 HRC	43.4	Conforms

11.2 Chemical composition of rotor blades :

Constituents	As per IS 6690:1981 (Reaffirmed 2012)		Composition as observed (% by weight)	Remarks
	Carbon Steel (%)	Silicon Manganese Steel (%)		
Carbon (C)	0.70 -0.85	0.50-0.60	0.693	Does not conform
Silicon (Si)	0.10 -0.40	1.50-2.00	0.235	Conforms
Manganese (Mn)	0.50 -1.0	0.50-1.00	0.958	Conforms
Sulphur (S)	0.05(max)	0.05(max)	0.018	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.030	Conforms

12. FIELD PERFORMANCE TEST

The field tests were conducted for 27.14 hours of field operation for testing the said Power Weeder. The field tests were conducted at rated rpm of 3000. The detailed test results are represented in the Annexure and summarized in the ensuing table:

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Sl.No.	Parameters	Observations
1	Type of soil	: Light
2	Soil moisture (%)	: 8.1 to 11.4
3	Bulk density of soil (g/cc)	: 1.53 to 1.58
4	Forward Speed of operation (kmph)	: 0.74 to 1.30
5	Depth of cut (cm)	: 6.3 to 8.0
6	Width of cut (m)	: 1.08 to 1.16
7	Area covered (ha/h)	: 0.066 to 0.111
8	Time required for one ha (h)	: 8.97 to 15.15
9	Field efficiency (%)	: 76.74 to 92.04
10	Weeding efficiency (%)	: 63.22 to 80.0
11	Fuel consumption	
	l/h	: 0.719 to 0.958
	l/ha	: 6.45 to 13.83

12.1 Rate of work:

- Rate of work was recorded as 0.066 to 0.111 ha/h and the forward speed of operation vary from 0.74 to 1.30 kmph.
- Time required to cover one hectare was recorded as 8.97 to 15.15 h.

12.2 Quality of work:

- Depth of cut was recorded as 6.3 to 8.0 cm.
- Working width was observed as 1.08 to 1.16 m.
- Field efficiency was found as 76.74 to 92.04 %.
- Weeding efficiency was found as 63.22 to 80.0 %

12.3 Adequacy of power of prime mover:

The power of prime mover was found adequate.

12.4 Wear Analysis of rotor blades:

Blade No.	Initial mass(g)	Final mass (g)	Loss of mass (g)	Percentage wear of rotor blades	
				After 27.14 h	Per hour
L-1	314.5	311.0	3.5	1.11	0.04
L-2	328.0	325.0	3.0	0.91	0.03
L-3	320.0	317.0	3.0	0.94	0.03
L-4	321.5	318.0	3.5	1.09	0.04
R-1	325.0	321.5	3.5	1.08	0.04
R-2	392.5	389.0	3.5	0.89	0.03
R-3	387.5	382.5	5.0	1.29	0.05
R-4	376.5	370.5	6.0	1.59	0.06

The hourly rate of wear of blade on mass basis after field operations was recorded as 0.03 to 0.06%.

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16. COMMENTS & RECOMMENDATIONS

- 16.1 The maximum Power and rated power were observed as 6.45 kW and 6.44 kW under natural ambient condition against the declared value of 5.5 kW by the manufacturer.
- 16.2 Back up torque of engine was observed as 11.36 %.
- 16.3 The maximum torque was observed as 22.84 N-m against the declared value of 18.0 N-m. This shall be looked into for corrective action.
- 16.4 The specific fuel consumption (SFC) of engine corresponding to maximum power and at rated engine speed was recorded as 299.0 g/kWh against declared value of 360 g/kWh.
- 16.5 Noise at operator's ear level was observed on 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 operator's comfort & safety.**
- 16.6 The amplitude of mechanical vibration marked as (*) is 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 the component in view of above this deserves to be given top priority for corrective action.
- 16.7 The hardness and chemical composition of rotary blades does not conform to the requirement of IS 6690:1981 (Reaffirmed 2012). This may be looked into for corrective action.
- 16.8 During oil pull over test percentage loss of oil was observed on higher side. It should be looked into corrective action.
- 16.9 Machine maneuverability while taking turns at head land during field operation was not comfortable. It shall be looked into for ease of operation for the operator.
- 16.10 While initial inspection it was found that machine model number on the labeling plate of the machine was different as per application form. On request of the applicant, it was allowed to correct it on the labeling plate. This shall be looked into for correction.
- 16.11 Model numbers mentioned on the engine & on the labeling plate of the machine were different. This should be looked into for correction.
- 16.12 There was no serial number mentioned on the machine. This should be looked into for correction.
- 16.13 It was observed that rotor shaft was broken twice while field performance test. On request of the applicant, it was repaired during field performance test after 4.31 & 5.41 hours of operation. This shall be looked into for improvement.

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16.14 Name plate/ labeling plate should be provided on the machine as per Indian Standard.

16.15 Adequacy of Literature

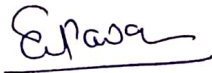
The following literature in English language was provided for reference during testing:

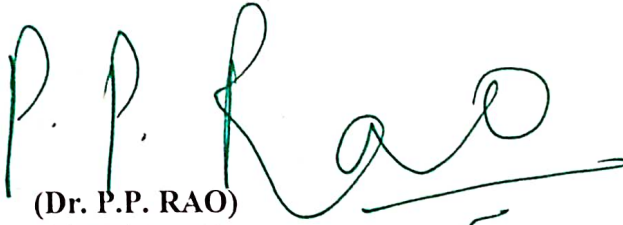
- Operator's/ Service manual
- Parts catalogue

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

TESTING AUTHORITY


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