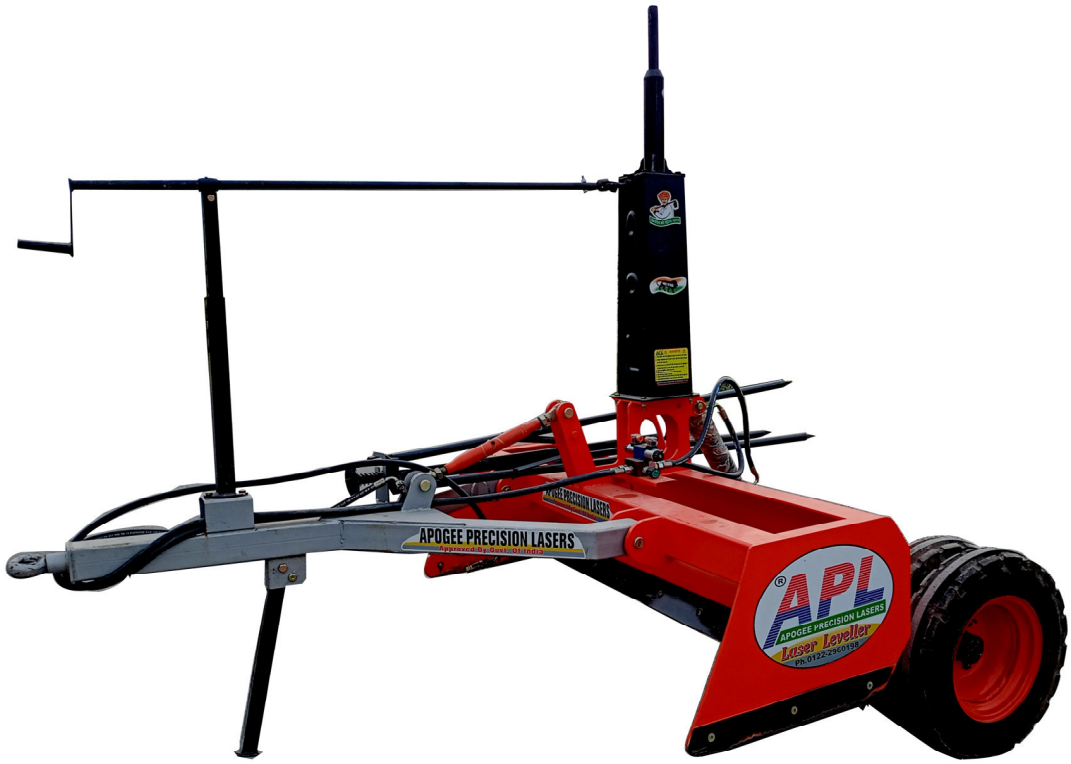
व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

संख्या/ **No.: IMP-1050/2832/2022**

माह/**Month: April, 2022**

THIS TEST REPORT VALID UP TO : 30th April, 2029



APOGEE PRECISION LASERS, APL-STANDARD LASER LAND LEVELER

सत्यमेव जयते

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

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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14.2 Chemical composition

Table- VIII.

Sr. No.	Material	Requirement as per IS: 9813-2002	As observed	Remark
1.	Carbon (C)	0.4 to 0.7	0.40	Conforms
2.	Silicon (Si)	--	0.17	--
3.	Manganese (Mn)	--	0.23	--
4.	Sulphur (S)	--	0.06	--
5.	Phosphorous (P)	--	0.00	--

15. RUNNING-IN

The laser land leveler was not running-in prior to start of the test as per the recommendation of the applicant.

16. FIELD TEST

The field tests of 25.59 hours with 4 replications were conducted. The field performance observations are given in Annexure-I to V.

The summary of field performance test is given in Table-IX.

Table-IX: Summary of field performance

Sl. No.	Parameters		Observations
i)	Tractor used		Mahindra Arjun 555 DI
ii)	Gear used		H-1
iii)	Type of soil		Sandy Loam
iv)	Soil moisture, %		9.10 to 10.10
v)	Bulk density of soil, g/cc		
	Before operation		1.41 to 1.45
	After operation		1.47 to 1.49
vi)	Area covered, ha/h		0.037 to 0.075
vii)	Time required for one hectare, h		13.33 to 27.03
viii)	Fuel consumption		
	- l/h		4.02 to 4.88
	- l/ha		55.60 to 107.20
ix)	Total volume of cut, m^3		20.90 to 64.97
x)	Total volume of fill, m^3		88.32 to 145.71
xi)	Total volume of earth work	m^3	123.78 to 208.72
		m^3/h	20.99 to 37.17
		m^3/l	5.22 to 8.91
xii)	Leveling Index before operation		5.99 to 9.24
xiii)	Leveling index after operation		0.17 to 0.29
xiv)	Draft requirement, kg		419.00 to 557.75

16.1 Rate of Work

16.1.1 The field capacity in sandy loam soil was recorded as 0.037 to 0.075 ha/h.

16.1.2 Total volume of cut 20.90 to 64.97 m^3

16.1.3 Total volume of fill 88.32 to 145.71 m^3

16.1.4 The time required to cover one hectare area was recorded as 13.33 to 27.03 h.

16.2 Quality of work

Leveling Index before and after field operation was observed from 5.99 to 9.24 and 0.17 to 0.29 respectively.

16.3 Fuel Consumption:

l/h : 4.02 to 4.88

l/ha : 55.60 to 107.20

17. CONFORMITY TO INDIAN STANDARD

17.1 Table -X: Material for different components of leveler (As per IS: 9813-2002)

S. No.	Components	Material(Requirements)	Observations
I	Frame	Mild steel	Mild steel
ii	Hitch	Mild steel	Mild steel
iii	Hitch pin	Carbon steel	Carbon steel
iv	Pin adjusting screw	Carbon steel	N.A.
v	Mould board frame	Mild steel	Mild steel
vi	Side plate	Mild steel	Mild steel
vii	Mould board	Mild steel	Mild steel
viii	Scarified	Carbon steel	N.A.

17.2 Other requirements: (As per IS: 9813-2002)

Sr. No.	REQUIREMENTS	Observations	Conformity
i	The size of terracer shall be determined by length of blade plus the length of extension blade if any, in meters. The nominal size of the terracer may be between 1.5 to 3.5 meter.	The size of terracer blade is 2.075 m.	Conforms
ii	The beveling shall be done on lower side of the blade. Both the upper and lower sides of the blade may be beveled to make it reversible.	Provided	Conforms
iii	The blade shall be beveled. The length of beveling may be 10 mm. The thickness of the edge shall be as far as possible uniform and may be between 1.5 to 3 mm.	Provided	Conforms
iv	The corners of the square holes shall be slightly rounded.	Round hole provided	Conforms
v	The holes of the blade shall be provided with counter-sunk bolts of 10-mm size. As far as possible, the bolts should conform to grade M10 of IS:2609-1964 'Specification for couch bolts (M6 to M24). The bolt head should flush with the blade surface.	The bolts of size 50.9×10.0×1.5 mm are provided & its heads are flushed with the blade surface.	Conforms
vi	The blade shall be free from cracks and should be reasonably free from flaws, such as seams, scales and pits.	The blade is free from cracks and flaws, such as seams, scales and pits.	Conforms

18. CRITICAL TECHNICAL SPECIFICATION

Sr. No.	Parameters	Specifications	Observed	Remarks
1	Power source	Tractor	Tractor	Conforms
Laser Transmitter				
2.	Laser source Wattage, mW	<5.0	0.09	Conforms
3.	Laser Source Range, mm	630 to 680	635	Conforms
4	Laser class	3A/3R	3R	Conforms
5	Operating Temperature, °C	-20 to +70±10%	-20 to+70±10%	Conforms
6	Compensation Method	Electronic self leveling through steeper Motor	Provided	Conforms
7	Rotation Speed, rpm	600 (min)	600	Conforms
8	Level Accuracy, mm/30m	1.5 (min)	2.75	Conforms
9	Operating Diameter, m	600-800	800	Conforms
10	Level Indicator	LED Flash	LED flash	Conforms
11	Power supply	Internal & External DC Battery with charger	Provided	Conforms
12	Enclosure	Rugged with minimum one-meter drop height on concrete	Provided	Conforms
Laser Receiver				
13	Laser Beam Reception	360°	360°	Conforms
14	Vertical Reception Window, mm	Four windows of 170 to 230 each	200	Conforms
15	Dead Band, mm	10 to 15	10	Conforms
16	LED Display	Red = Hi/Low, On grade = Green	Provided	Conforms
17	Operating Temperature, °C	-20 to +70 ±10%	-20 to 70±10%	Conforms
18	Operating range, m	400- Radius	400- Radius	Conforms
19	Laser RPM	600/1200	600	Conforms
20	Enclosure	Rugged, aluminum or any other alloy, Rust proof.	Provided	Conforms
Control Box				
21	On Grade LED's	Green	Green	Conforms
22	High/Low LED's	Red	Red	Conforms
23	Operating Voltage	10 to 30 VDC, Polarity protected	12V	Conforms
24	Operating temperature, °C	-20 to + 70 ± 10%	-20 to +70±10%	Conforms
25	Electrical connections	All standard military type	Provided	Conforms
26	Valve compatibility	Proportional type (On/off) only	Provided	Conforms

27	Current Usage, Amp(A)	5 to 10	5	Conforms
28	Switch Options	Raise/Lower, Auto Manual	Provided	Conforms
29	Enclosure type	Casted Aluminum or any alloy, Rust proof	Provided	Conforms
30	Cables	Set of cables with Military connectors	Provided	Conforms
31	Accessories	Survey scale, Survey receiver	Provided	Conforms
Bucket Scrapper				
32	Working Width, mm	1500 to 2500	2095	Conforms
33	Bucket Depth, mm	600 (Min)	690	Conforms
34	Material	MS sheet, B2062/EN 10130	M.S sheet	Conforms
	Sheet thickness, mm	10	10	Conforms
35	Blade Height, mm	125 ± 5	125	Conforms
36	Blade thickness, mm	12 ± 0.5	12	Conforms
37	Blade material	High carbon steel, EN8 and above	High carbon steel	Conforms
38	No. of tyres	2/4 (6×16)	Provided	Conforms
39	Mast	Rigid Mast/Gear Mast/Electric mast	Gear Mast	Conforms
40	Hydraulic Cylinder	Automatic double Acting hydraulic cylinder	Provided	Conforms
41	Hydraulic valve	Automatic double acting hydraulic valve assemble with pressure relive valve.	Provided	Conforms
42	Accessories	Set of High-Pressure hoses, Firm tripod stand, top link	Provided	Conforms
43	Marking/labeling of machine	The labeling plate should be riveted on the body of machine having name & address of manufacturer, country of origin, make, model, year of manufacturer, serial number, wt in kg, tractor kW/hp.	Provided	Conforms
44	Literature	Operator manual, service manual & parts catalogue should be provided.	Provided	Conforms

Note:- The implementation of critical technical specifications has been deferred till 30.09.2022 vide Ministry's O.M. No. 13-1/2021-M&T (I&P) dated 03.02.2022

19. SOUNDNESS OF CONSTRUCTION

No noticeable breakdown during 25.59 hours of field operation was observed.

20. COMMENTS & RECOMMENDATION

20.1 The safety warnings, signs and pictograms are not provided on the machine. It should be provided for safety of the users.

21. TECHNICAL LITERATURE

Following literature was submitted by applicant for reference during test.

(i) Operator manual
(ii) Parts catalogue
(iii) Service manual

However, the manuals need to be updated as per IS: 8132-1999.

TESTING AUTHORITY

SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN **DIRECTOR**	01.04.2022

Draft Test Report Compiled by Sh. Deny Hasnu, Sr. Technician

22. APPLICANT'S COMMENTS

No specific comments received from the applicant