व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT (ICT)

संख्या / No. : IMP-767/1807/2015
माह / Month: December, 2015

# LASER LAND LEVELLER
# TOPCON, SYSTEM FIVE

सत्यमेव जयते

भारत सरकार
कृषि एवं किसान कल्याण मंत्रालय
(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE & FARMERS WELFARE
(DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE)

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
ट्रैक्टर नगर, सिरसा रोड़, हिसार- 125001 (हरियाणा)

NORTHERN REGION FARM MACHINERY TRAINING AND TESTING INSTITUTE
TRACTOR NAGAR, SIRSA ROAD, HISAR-125001 (HARYANA)

दूरभाष/Phones: 01662-276172
फैक्स स०/Fax No. 01662-276984

वेबसाईट / Website: http://nrfmtti.gov.in
ई-मेल/ E-mail: fmti-nr@nic.in

| | | | |
|---|---|---|---|
| ii | The welding of various parts shall be free from blow holes, exposed porosity, exposed inclusions unfilled crate and un fused welds. | The welding of various parts are free from blow holes, exposed porosity, exposed inclusions unfilled crate and un fused welds. | Conforms |
| iii | The exposed metallic parts shall be free from rust and shall have a protective coating. | The exposed metallic parts are free from rust and have a protective coating. | Conforms |
| **5.13** | **Marking and packing:** | | |
| | Marking- Each terracer shall be marked with:<br>a) Manufacturer's name and trade-mark, if any.<br>b) Size; and<br>c) Batch or code number<br>These particulars shall be stamped, embossed or engraved on metallic plate and rigidly fitted on a non-wearing part of terrace. | Labeling plate not provided, however only a sticker of make & manufacturer name is provided on mould board frame of laser land leveler. | **Does not conform** |

## 6. FIELD TEST

The field tests of 20.06 hours with 5 replications were conducted. The each replication was of minimum 3.41 hour. The field performance observation are given in annexure II.

The summary of field performance test is given in Table VIII.

**TABLE-VIII: Summary of field performance**

| Sl. No. | Parameters | Observations |
|---|---|---|
| i) | Tractor used | New Holland-3630 TX |
| ii) | Gear used | H-1 |
| iii) | Type of soil | Sandy loam |
| iv) | Av. soil moisture, % | 2.9 to 12.6 |
| v) | Bulk density of soil, g/cc<br>Before operation(Undisturbed soil)<br>After operation(Disturbed soil) | <br>1.739 to 1.792<br>1.498 to 1.576 |
| vi) | Av. Depth of cut, mm | 17 to 30 |
| vii) | Av. Working width, m | 1.97 to 2.11 |
| viii) | Av. speed of operation, kmph | 4.54 to 5.02 |
| ix) | # Wheel slippage, % | 7.41 to 13.30 |
| x) | * Area covered, ha/h | 0.038 to 0.065 |
| xi) | Time required for one hectare, h | 15.43 to 26.17 |
| xii) | Fuel consumption | |
| xiii) | - l/h | 3.32 to 3.78 |
| | - l/ha | 51.29 to 98.86 |
| xiv) | Draft requirement, kg | 677 to 1415 (Avg. 998 kg) |
| xv) | Range dia. of laser beam, m | 650 |

| | | |
|---|---|---|
| xvi) | Land slope before operation , % | |
| | Lengthwise | 0.254 to 0.807 |
| | Widthwise | 0.163 to 0.461 |
| xvii) | Land slope after operation , % | |
| | Lengthwise | 0.041 to 0.077 |
| | Widthwise | 0.038 to 0.114 |
| xviii) | Blade bucket capacity, kg (Approx) | 723 to 761 |
| xix) | Coefficient of variation of leveling after leveling | 0.003 to 0.006 |
| xx) | Evenness in leveling, % | 99.4 to 99.7 |

# Vary with depth of cut of blade
* Vary with land slope & depth of cut

**6.1 Rate of Work**

6.1.1 The rate of work in sandy loam soil was recorded as 0.038 to 0.065 ha/h and the forward speed as 4.54 to 5.02 kmph.

6.1.2 The time required to cover one hectare area was recorded as 15.43 to 26.17 h.

6.1.3 Fuel consumption of tractor varies from 3.32 to 3.78 l/h whereas fuel consumption per hectare varies from 51.29 to 98.86 l/ha.

**6.2 Quality of work**

6.2.1 Depth of cut of soil cutting blade was varies from 17 to 30 mm.

6.2.2 Slope of land across its length & width after laser leveler operation was observed as 0.041 to 0.077% & 0.038 to 0.114% respectively.

6.2.3 Coefficient of variation & evenness of the operation of leveling after operation were observed as 0.003 to 0.006 and from 99.4 to 99.7 % respectively.

6.2.4 Working diameter of laser beam was recorded 900 m.

## 7. EASE OF OPERATION, ADJUSTMENTS & SAFETY

7.1 Depth of cut of soil cutting blade can be adjusted by raising/lowering the receiver height from operator seat & for this operator need not to get down from tractor

7.2 Maneuverability of the laser leveler unit during field operation was satisfactory.

## 8. SOUNDNESS OF CONSTRUCTION

No breakdown occurred during 20.06 hrs. of operation.field operation

## 9. COMMENTS & RECOMMENDATIONS

9.1 Quality of field leveling was satisfactory.

9.2 Deflection of laser beam before & after the field test was within the limit & the deflection was also normal after the temperature gradient & vibration test.

9.3 No leakage of hydraulic oil from hydraulic circuits observed during field & lab test.

9.4 No moisture or water vapour were observed inside emitter prism glass when tested for water resistance.

9.5 Dimensions and hardness of soil cutting blade does not conform to the limit specified in IS: 9813:2002. It should be looked into in future at regular production level for corrective action.

9.6 Draft requirement varies from 677 to 1415 kg, where as the average draft requirement was observed as 998 kg.

9.7 Working range diameter of laser beam was observed as 650 m against the declared value of 800 m. It should be looked into.

| | | |
|---|---|---|
| xvi) | Land slope before operation , % | |
| | Lengthwise | 0.254 to 0.807 |
| | Widthwise | 0.163 to 0.461 |
| xvii) | Land slope after operation , % | |
| | Lengthwise | 0.041 to 0.077 |
| | Widthwise | 0.038 to 0.114 |
| xviii) | Blade bucket capacity, kg (Approx) | 723 to 761 |
| xix) | Coefficient of variation of leveling after leveling | 0.003 to 0.006 |
| xx) | Evenness in leveling, % | 99.4 to 99.7 |

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9.6 Draft requirement varies from 677 to 1415 kg, where as the average draft requirement was observed as 998 kg.

9.7 Working range diameter of laser beam was observed as 650 m against the declared value of 800 m. It should be looked into.

9.8 Marking of the implement does not conform the requirements of IS: 9813:2002. The identification plate is not provided. It should be provided on implement with following information.

i) Make and model

ii) Serial No. & size

iii) Year of manufacturer

iv) Trade name

v) Approx mass

vi) Minimum power of prime mover/tractor kW/Ps.

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

i) The serial No. of the implement is not provided. Each implement shall have serial No./identification No.

## 10. LITERATURE :

No literatures was supplied by the manufacture regarding operation, maintenance & service of implement except leaflets showing fabrication, assembly & testing of laser unit and brief information of laser unit of Topcon Sokkia India Pvt. Ltd. applicant for reference during test.

The literature as operator's manual, parts catalogue and service manual should be brought out as per IS:8132:1999 in Hindi & other regional languages for the guidance of users & technical personnel.

## TESTING AUTHORITY

| | |
|---|---|
| **G.R. AMBALKAR**<br>**Agricultural Engineer** | |
| **R.K. NEMA**<br>**Senior Agricultural Engineer** | |
| **HIMAT SINGH**<br>**Director** | |

Test report compiled by: **Sh. Maan Singh, Sr. Tech. Assistant**

## 11. APPLICANT'S COMMENTS

| Para No. | Our Reference | Applicant's Comments |
|---|---|---|
| 11.1 | 9.5, 9.7, 9.8 & 9.9 | We would like to assure that, we definitely take care of the points listed and will work in the direction to improve. |