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BUREAU OF INDIAN STANDARDS

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भारतीय मानक मसौदा

जलरोधक परीक्षण के लिए कृषि ट्रैक्टर की तकनीकी आवश्यकताएं - परीक्षण प्रक्रियाएं

{आइ एस 11082 का पहला पुनरीक्षण}

Draft ***Indian Standard***

TECHNICAL REQUIRMENTS OF AGRICULTURAL TRACTOR FOR WATER PROOFING TEST -TEST PROCEDURES

{First Revision of IS 11082}

ICS 65.060.10

FAD 11 — Agricultural Machinery and Equipment Sectional Committee

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FOREWORD

Wet land cultivation, popularly known as puddling is an important tillage operation in the cultivation of transplanted paddy. The agricultural tractors are increasingly being used for wet land cultivation. The success of mechanized paddy cultivation with the agricultural tractors depends upon efficiency of waterproofing functions of critical assemblies. A need was, therefore, felt to formulate an Indian Standard on this subject for the guidance of the manufacturers and users.

In the formulation of this Indian Standard, assistance has been derived from OECD Code 2

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2: 2022 ‘Rules for rounding off numerical values (revised)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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Indian Standard

TECHNICAL REQUIRMENTS OF AGRICULTURAL TRACTORS FOR WATER PROOFING TEST – TEST PROCEDURES

1. Scope

This standard covers the technical requirements of water proofing for use of agricultural tractors for wet land application.

2. References

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

IS No.	*Title*
ISO 4251-1:2019	Code designated diagonal tyres (ply rating marked series) for agricultural tractors, trailers and machines — Part 1: Tyre designation and dimensions, and approved rim contours

3. General

3.1 The waterproofing test is applied to wheeled or track-laying tractors to be used in the paddy field for pudding.

3.2 The primary purpose is to verify the waterproofing functions of the wheel axles, the brake assembly and the clutch assembly.

3.3 Verification can however be extended at the request of the manufacturer to other parts of tractors such as engine sump, hydraulic/transmission case and self-starter that could be damaged by water penetration.

3.4 The tractor is classed as “waterproof tractor,” if after the test described below, there is no water penetration into axle, brake, clutch system, or any other part submitted to the verification.

4. Test conditions

4.1 Test bed

The test shall be conducted in a cistern (*see* Fig 1). The tractor shall be set on the roller bed (or on a similar device) where the tractor remains safely fixed during the test. For two-wheel-drive tractors the front axle shall be driven by external means (*see* Fig 1) at the same equivalent ground speed as the rear axle.

4.2 Water level

The water level shall be adjusted to the height of the centre line of the front axle (wheeled tractor) or the driven sprockets (track-laying tractor) with the tractor in a horizontal position, as if driving on a road. However, if the centre line is higher than 400 mm above ground level (in accordance with ISO 4251-1) the water level shall only be raised to 400 mm above the ground level.

Potable water shall be used in the cistern.

5. Test procedures

5.1 General provisions

The tractor shall be in the gear giving the nominal forward speed nearest to 6km/h and operated continuously at rated speed for 2 hours. The tractor shall then (immediately) be removed from the cistern and any excess water shall be wiped off the outside of the axles, clutch and brake assemblies with a rag. The tractor shall be left in a place free from rain or snow for at least 12 hours before being finally checked.

The axles (including centre pivot), clutch housing, the brake assembly and any other part also optionally submitted for test shall then be disassembled and any evidence of water penetration into them shall be stated in the test report.

5.2 Unsuccessful test

If the test fails, the manufacturer may ask for a repeat test of the same tractor but only once. The tractor when re-tested, shall be equipped with the same components after the seals have been changed and/or re-fixed in conformity with manufacturing specifications.

6. Checking methods

6.1 Non-lubricating parts (e.g. ‘dry’ brakes)

‘Dry’ type clutch housings, and similar ‘dry’ tractor components, shall be checked visually inside for water ingress as indicated by actual water or rust from oxidation.

6.2 Oiled parts

For the tractor's parts running in oil and under test, the oil in the housing shall be checked using one or more of the following alternative methods:

6.2.1 *Visual method*

Distinct emulsification and/or colour change of the oil shall be regarded as proof of water-ingress.

6.2.2 *Crackling method*

When water ingress is not visually distinct, the presence of water in the lubricant shall be checked by putting a heated electric soldering iron into the oil. The presence of water crackling shall be regarded as waterproofing failure; conversely, no crackling shall be regarded as waterproofing.

6.3.3. *Other methods*

Other physical (e.g. centrifugation) or chemical (e.g. Karl-Fisher) standards to check if there is water in the oil are accepted.

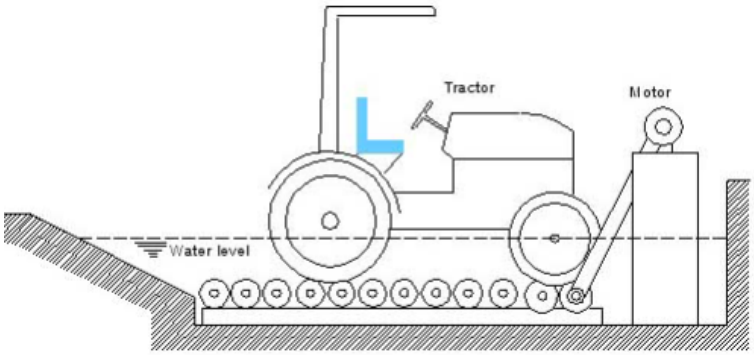

FIG 1. A TYPICAL EXAMPLE OF CISTERN FOR WATERPROOFING TEST