
Test facilities for agricultural irrigation equipment

Installations d'essais pour le matériel agricole d'irrigation



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

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Test facilities for agricultural irrigation equipment

1 Scope

This Technical Report is intended to provide guidance on the design, selection, installation and use of the equipment required to establish basic test facilities for irrigation equipment evaluation. Its purpose is to provide information sufficient to complement the detailed procedures included in ISO 9261, ISO 15886, ISO 7714, ISO 9635, ISO 9644, ISO 9911, ISO 9952 and ISO 10522 for the testing of agricultural irrigation system components, specifically: emitters, sprinklers and valves.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15886-1, *Agricultural irrigation equipment — Sprinklers — Part 1: Definition of terms and classification*

ISO 15886-3, *Agricultural irrigation equipment — Sprinklers — Part 3: Characterization of distribution and test methods*

ISO 9261, *Agricultural irrigation equipment — Emitters and emitting pipe — Specification and test methods*

ISO 7714, *Agricultural irrigation equipment — Volumetric valves — General requirements and test methods*

ISO 9635, *Irrigation equipment — Hydraulically operated irrigation valves*¹⁾

ISO 9644, *Agricultural irrigation equipment — Pressure losses in irrigation valves — Test method*

ISO 9911, *Agricultural irrigation equipment — Manually operated small plastics valves*

ISO 10522, *Agricultural irrigation equipment — Direct-acting pressure-regulating valves*

ISO/IEC 17025:1999, *General requirements for the competence of testing and calibration laboratories*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

test bench

collection of components, including water supply/receiving reservoir, piping, fittings and instrumentation, assembled to test an agricultural irrigation component

1) Under revision.

3.2

test facility

collection of components, including water supply, test bench(es) and shelter, used to test agricultural irrigation valves, sprinklers and emitters

3.3

net positive suction head available

arithmetic difference between the available total suction head at the impeller of a centrifugal pump and the vapour pressure head

3.4

net positive suction head required

arithmetic difference between the total suction head at the impeller of a centrifugal pump required for the pump to operate properly and the vapour pressure head, as specified by the manufacturer

3.5

static pressure head

sum of the head associated with atmospheric pressure and the gauge pressure head measured approaching the inlet of the impeller of a centrifugal pump

3.6

total suction head at the impeller of a centrifugal pump

sum of the static pressure head and the velocity head measured approaching the inlet of the impeller of a centrifugal pump and corrected to the centreline of the impeller for a centrifugal pump mounted horizontally or to the datum of the tip of the inlet vanes for a centrifugal pump mounted vertically

3.7

vapour pressure head

head associated with the absolute pressure at which a liquid vaporizes, as determined by the physical properties of the liquid and its temperature

4 System components

4.1 Pumps and pump environment

For specific requirements prior to selecting a pump, see Annex A for sprinklers, Annex B for emitters and emitting pipe, and Annex C for valves.

4.1.1 Selection

The size and type of pump selected depend on the requirements of the equipment to be tested. More than one pump may be required depending on the range of flows and pressures required by the equipment to be tested. Identify the equipment, test flow range and test pressure range before selecting a pump.

Select a centrifugal pump or a turbine pump based on the desired configuration of the test bench.

Ensure that the pumps and controls selected provide the required hydraulic characteristics continuously and without vibration that could affect the measurement accuracy. Dampen turbulence or use flow-straightening vanes in critical locations such as the inlet to a sprinkler test riser. Employ a variable-frequency drive (VFD) to control the motor, allowing the pump to operate over a wider range of flows and pressures.

Control the flow using equipment installed on the test bench (nozzle, emitters, valve, regulator and pipe size) and/or by the speed at which the pump is operated. Control flow and/or pressure with regulating valves on the inlet or outlet pipe, as needed.