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Agricultural irrigation equipment — Test facilities for agricultural irrigation equipment —

Part 1: General

Matériel agricole d'irrigation — Installations d'essais pour le matériel agricole d'irrigation —

Partie 1: Général

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 18, *Irrigation and drainage equipment and systems*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This first edition cancels and replaces ISO/TR 15155:2005, which has been technically revised to include sprayers (ISO 8026) and water meters (ISO 16399).

A list of all parts in the ISO/TR 15155 series can be found on the ISO website.

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Agricultural irrigation equipment — Test facilities for agricultural irrigation equipment —

Part 1: General

1 Scope

This document gives guidelines for the design, selection, installation and use of the equipment required to establish basic test facilities for irrigation equipment evaluation. It provides the information sufficient to complement the detailed procedures included in ISO 7714, ISO 8026, ISO 9261, ISO 9635 (all parts), ISO 9644, ISO 9911, ISO 10522, ISO 15886 and ISO 16399 for the testing of agricultural irrigation system components, specifically emitters, sprinklers, valves, sprayers and water meters.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
test bench
collection of components, including water supply/receiving reservoir, piping, fittings and instrumentation, assembled to test an agricultural irrigation component

3.2
test facility
collection of components, including water supply, *test bench(es)* (3.1) and shelter, used to test agricultural irrigation valves, sprinklers and emitters

3.3
net positive suction head available
NPSHa
arithmetic difference between the available *total suction head at the impeller of a centrifugal pump* (3.6) and the *vapour pressure head* (3.7)

3.4
net positive suction head required
NPSHr
arithmetic difference between the *total suction head at the impeller of a centrifugal pump* (3.6) required for the pump to operate properly and the *vapour pressure head* (3.7), as specified by the manufacturer

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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* (3.5) 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

4.1.1 General

For specific information prior to selecting a pump, see Annex A for sprinklers, Annex B for emitters and emitting pipe, Annex C for valves, Annex D for sprayers and Annex E for meters.

4.1.2 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. The equipment, test flow range and test pressure range should be selected before selecting a pump.

A centrifugal pump or a turbine pump is selected based on the desired configuration of the test bench.

The pumps and controls should be selected to provide the required hydraulic characteristics continuously and without vibration to avoid affecting the measurement accuracy. Turbulence should be dampened or flow-straightening vanes should be used in critical locations, such as the inlet to a sprinkler test riser. A variable-frequency drive (VFD) should be employed to control the VFD rated motor, allowing the pump to operate over a wider range of flows and pressures.

The flow is controlled 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. The flow and/or pressure should be controlled with regulating valves on the inlet or outlet pipe, as needed.

The pump should provide at least 110 % of the maximum pressure at 110 % of the maximum flow rate required for the device being tested. The pump curve for the selected pump should be reviewed to ensure it will operate over the required range.

4.1.3 Installation

The pump should be installed in a configuration that does not require priming and in which the water supply/receiving tank has sufficient volume so that temperature change of the water during a test does not exceed the testing criteria.

Filtration should maintain the quality of the water supply and is necessary to meet the requirements of the equipment to be tested. If no specific filtration standard is required, the equivalent of a 200 mesh

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