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Agricultural irrigation equipment — Filters — Verification of filtration grade

Matériel agricole d'irrigation — Filtres — Vérification du grade de filtration

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Foreword

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The committee responsible for this document is ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 18, *Irrigation and drainage equipment and systems*.

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Agricultural irrigation equipment — Filters — Verification of filtration grade

1 Scope

This International Standard specifies a test method for the verification of filtration grade of filters intended for operation in agricultural irrigation systems. It is intended to be used for verifying the filter manufacturer's declaration about the filtration grade of a specific filter.

This test method uses a Clogging Capacity Meter (CCM) device to compare the filtration grade of the filter under test against the filtration grade of a test filtration screen.

NOTE This test method may also be used by a filter manufacturer to determine the filtration grade.

2 Normative references

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

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

3 Terms and definitions

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

3.1
filtration grade
number, declared by the manufacturer, that represents the size of water passages in a filter and is related to its ability to stop particles

Note 1 to entry: The filtration grade is expressed in micrometres (μm, microns).

3.2
clogging capacity meter
CCM
device used for measuring the time to reach a specified pressure loss across a standard filter screen, at a constant flow rate

3.3
aperture width
distance between two adjacent parallel wires in a square-mesh wire cloth screen plain-weave

3.4
mesh count
number of apertures per unit of linear measure in a woven wire cloth or wire screen

[SOURCE: ISO 9045:1990, 3.2.8]

3.5
flow rate
volume of water flowing through a device per unit time

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3.6
pressure loss
difference in pressure due to water flow between two specified points in a system or in part of a system

Note 1 to entry: It is expressed in pascals (Pa) according to ISO 80000–1, in kilopascals (kPa) or in bar.

4 Summary of the test method

Two CCM units, using identical test screens, are connected to the water mains, one upstream and one downstream of the filter under test.

Water at a flow rate of 10 l/min is passed through each CCM screen and the time required for each CCM to reach a predetermined pressure loss (0,5 bar) across its own screen is recorded.

The ratio between the two time periods, measured at the downstream and the upstream CCM units, is calculated. A ratio equal to or greater than five indicates that the filtration grade declared by the manufacturer is correct.

5 CCM structure and operation

5.1 Construction

The CCM device consists of two main parts (see Figure 1).

5.1.1 Sampler (1)

The sampler is the part of the CCM through which water used for testing flows. It includes the following:

— **screen housing** (3), capable of being opened and closed for cleaning and for easy replacement of the **filtering screen** (4);

— **flow rate regulator** (5), accurate to ±2 %, limiting the flow rate to 10 l/min.

5.1.2 Control unit (2)

The control unit includes the following measuring instruments:

— **pressure gauge** (9) accurate to ±1 %, measuring up to 10 bar;

— **differential pressure gauge**, digital or analog (10) accurate to ±1 %;

— **count up digital timer** (6) with a resolution of 0,01 min, preferably starting automatically when the pressure reaches a pre-determined level;

— **timer start switch** (12);

— **timer reset button** (11), setting the timer back to zero;

— **tubes** (7 and 8) connecting the control unit to the sampler. Pressure tap construction shall be in accordance with ISO 9644.

5.2 Mode of operation

5.2.1 Insert a “sealed” screen, same as that used for testing but that is covered and sealed by a thin plastic film into the screen housing. Apply an inlet pressure of $(1^{+0,2})$ bar. Make certain that no water is emerging from the CCM outlet.

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