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Weather-Based Landscape Irrigation Control Systems

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Introduction and Background Information

This standard describes testing procedures to evaluate how well landscape irrigation controllers respond to plant water demands when they are actively growing. This test standard was created in response to a request from the Irrigation Association based on a testing protocol created by the Smart Water Application Technologies committee in 2008 and has been used as the basis for the U.S. Environmental Protection Agency WaterSense program for labeling and certifying irrigation controllers. The standard includes Test Method #1 which is a 30-day test that measures the controller's capability to apply an adequate amount of water with minimal excess water application. Test Method #2, as described in Appendix A, is a separate test procedure that covers a 90-day period of time that utilizes an hourly soil moisture balance and evaluates a controller's capability to maximize the benefit of rainfall and irrigation frequency while considering the criteria of irrigation adequacy and excess water application.

1 Purpose and Scope

1.1 This standard describes a test method to determine an irrigation controller's ability to respond to weather and conditions found within the typical landscape. Sometimes called "smart control systems" or "smart controllers," these are controllers or devices that respond to environmental conditions by estimating or measuring depletion of available plant soil moisture in order to operate an irrigation system, replenishing water as needed while minimizing excess water use. A properly programmed smart controller requires initial site-specific set-up and will make irrigation schedule adjustments, including runtimes and/or required cycles throughout the irrigation season without human intervention. The standard will measure the ability of the controllers to provide adequate and efficient irrigation while minimizing potential losses.

It is recognized that controlling the irrigation of turf and landscape is a combination of scientific theory and subjective judgments. The attempt in developing this standard is to use only generally recognized theory and to avoid judgments involving the art of irrigation. The standard then recognizes that only the theory of irrigation is controllable by the skill of the controller manufacturer.

1.2 The objective of this standard is to provide a test method that evaluates how well technology has integrated scientific data into a practical system that meets the agronomic needs of the turfgrass and landscape plants. This evaluation concept requires the use of accepted formulas for calculating crop evapotranspiration (ET_c) or landscape evapotranspiration (ET_L). Versions of this type of controller could include one or more of the following:

- On-site weather sensors to determine irrigation needs;
- Weather data received from an off-site source;
- Technology that is added to existing time-based controllers that interfaces with either the controller program or electrical output to zone valves; and
- Historical reference evapotranspiration (ET_o) data characteristic of the site, in conjunction with other inputs.

1.2.1 This evaluation shall be accomplished by defining a virtual landscape and connecting an irrigation controller to a datalogger that records signals sent to irrigation control valves. Any weather sensors will be

