WaterSense® Public Meeting

Draft Specification for Spray Sprinkler Bodies

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January 18, 2017

Housekeeping

- All attendees are muted to minimize background noise.
- Please type questions into the Questions box in the GoToWebinar control panel. We will have a dedicated time for Q&A during the presentation and at the end as time allows.
- This webinar will be recorded.
- The PowerPoint presentation will be posted on the website.

Meeting Agenda

- Introduction to WaterSense
- Specification Development for Spray Sprinkler Bodies
- Test Method Development and Performance Testing
- Draft Specification for Spray Sprinkler Bodies
  - Scope
  - Water Efficiency and Performance Criteria
  - General Sprinkler Body Requirements
  - Product Marking Requirements
- Certification and Labeling
- Next Steps

Introduction to WaterSense

WaterSense

WaterSense is a voluntary program EPA launched in 2006 that provides a simple way to identify water-efficient:

- Products
- Programs
- Practices
- Homes

Products are independently certified for water efficiency **and** performance

WaterSense Labeled Products

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Irrigation Controllers

Lavatory Faucets

Flushing Urinals

More than 20,000 WaterSense Labeled Product Models

Tank-Type Toilets

Showerheads

Pre-rinse Spray Valves

Flushometer-Valve Toilets

ENERGY STAR

Water factors are also included in many ENERGY STAR® certified products

Accomplishments

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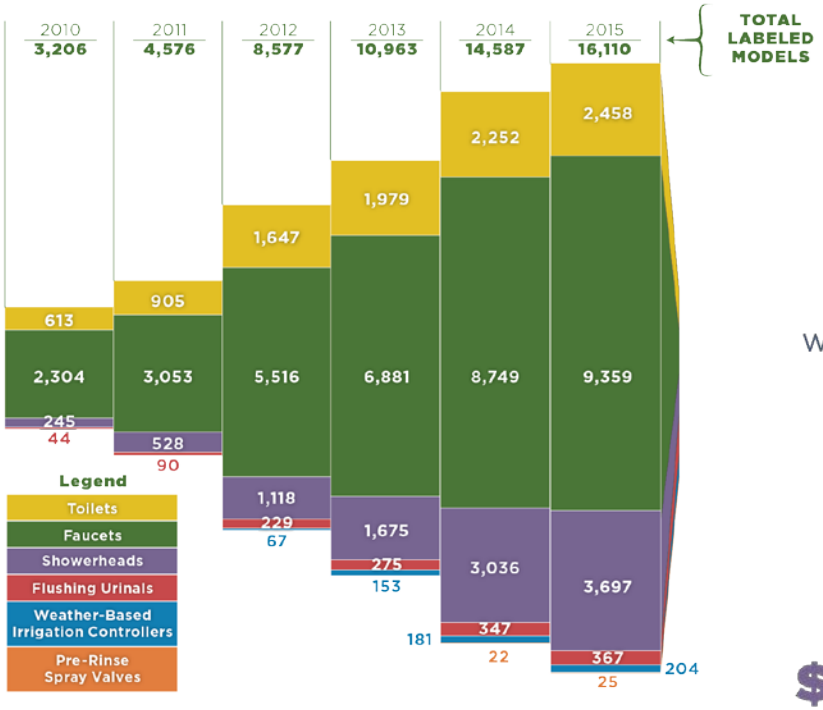
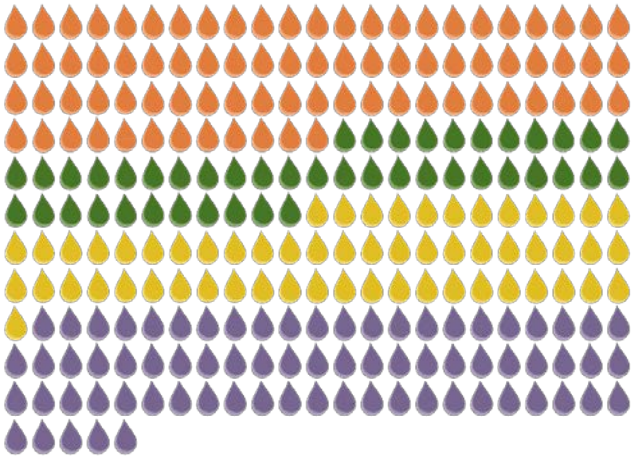
WaterSense Labeled Products

Ever since the first WaterSense labeled toilets hit store shelves in 2007, more and more product types have earned the WaterSense label, and the total number of WaterSense labeled models continues to grow.



1.5 trillion gallons of water saved since 2006!



437 billion gallons saved in 2015

That's **more than** the amount of water used by all of the households in **California** **for a year!**

WaterSense partners helped...

...consumers save **$32.6 billion** in water and energy bills

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Specification Development for Spray Sprinkler Bodies

Notice of Intent

- Released NOI for Landscape Irrigation Sprinklers in July 2014
- Proposed specification development for both high-efficiency nozzles and pressure-regulating sprinkler bodies
- Based on public comment and lack of savings data for nozzles, WaterSense moved forward only with specification development for sprinkler bodies with integral pressure regulation

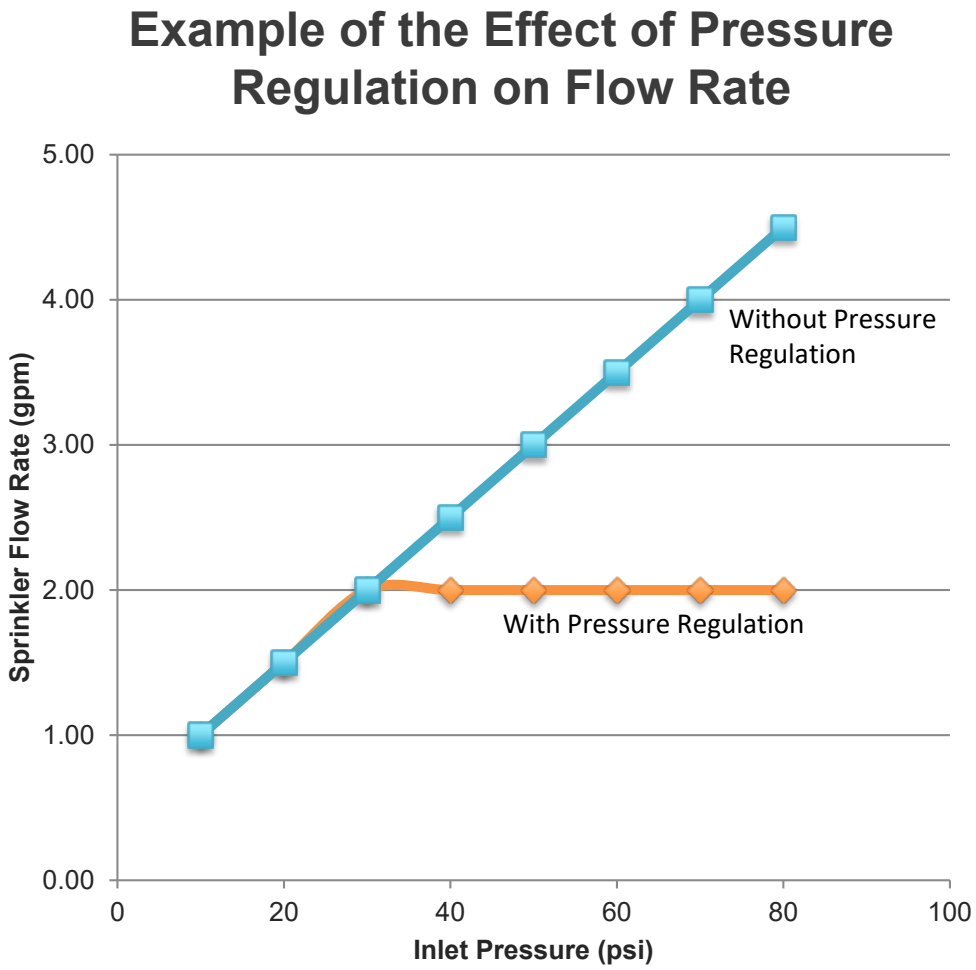
Spray Sprinkler Bodies with Integral Pressure Regulation

- Most sprinklers on the market have operating pressures between 15 and 70 psi with a recommended pressure of between 30 and 45 psi
- Many irrigation systems operate at pressures higher than recommended
- Higher operating pressure can result in system inefficiencies
  - Excessive flow rates
  - Misting
  - Fogging
  - Uneven coverage

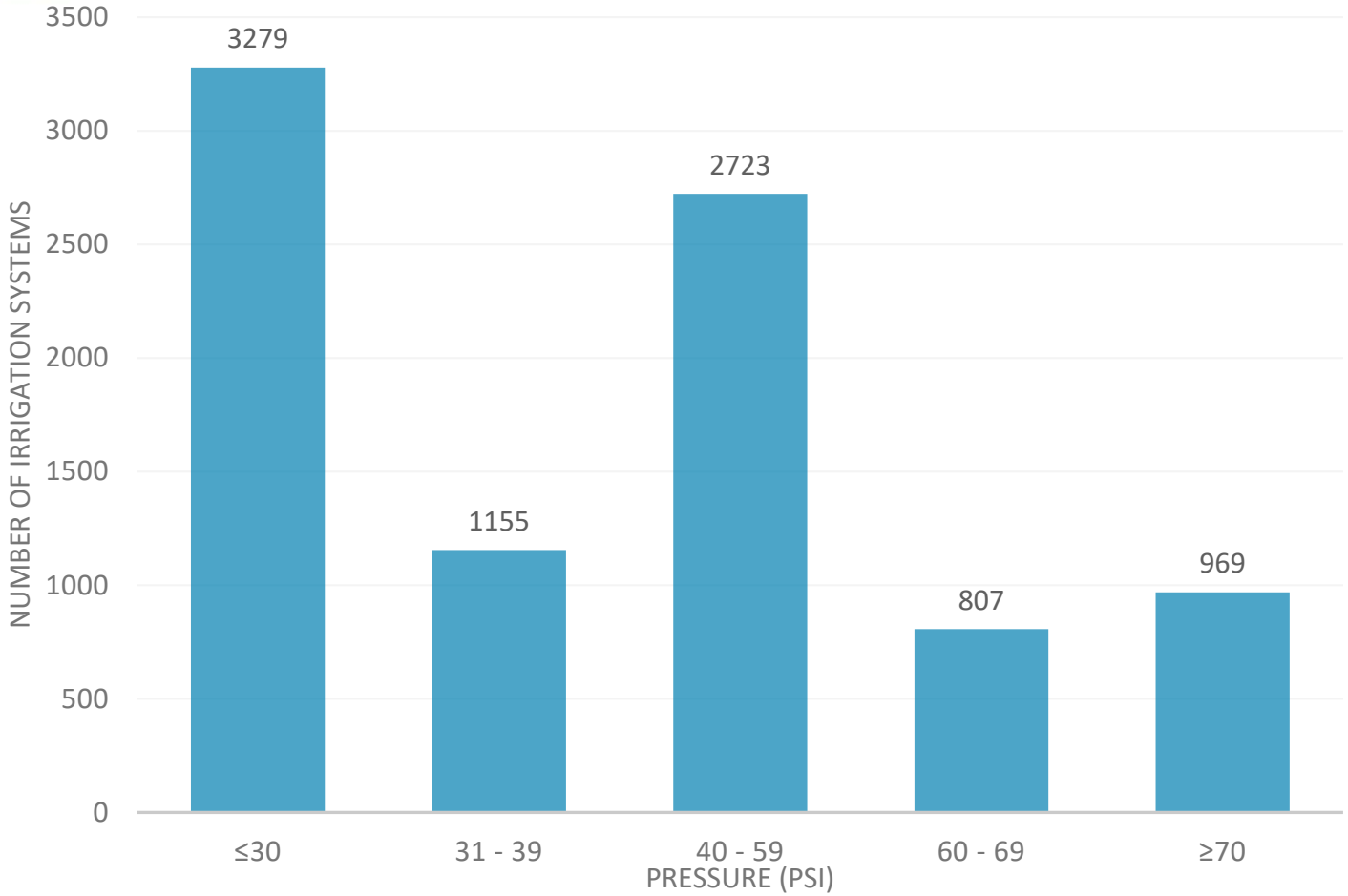
Photo: Brent Mecham, IA

Spray Sprinkler Bodies with Integral Pressure Regulation

- Sprinklers with integral pressure regulation maintain constant outlet pressure and flow across a range of inlet pressures
- This reduces excessive flows and waste that would otherwise occur at high pressures
- The nozzle is also able to generate appropriate water droplet size and provide for more uniform distribution of water across the landscape



Opportunity for Water Savings



Irrigation System Pressure Data, Utah State University and Center for Resource Conservation

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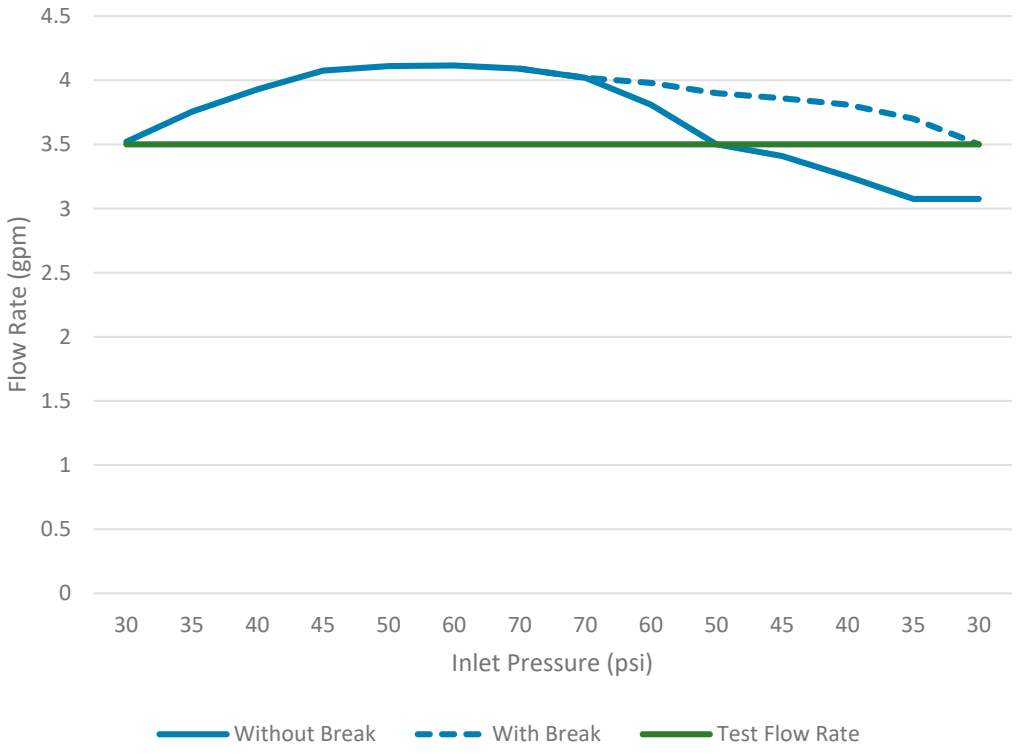
Test Method Development and Performance Testing

Test Method Development

Conducted performance testing with three independent labs in 2015 to validate a draft test method primarily based on *ASABE/ICC 802-2014*.

Modifications include:

- Added high flow rate (3.5 gpm) in addition to 1.5 gpm flow rate
- Measured flow in addition to outlet pressure
- Reduced number of test levels from 12 to 5
- Allowed a variety of methods to control flow (e.g., needle valve, variable arc nozzle)
- Introduced a reduction to 0 psi between test levels to address hysteresis



Test Method Development

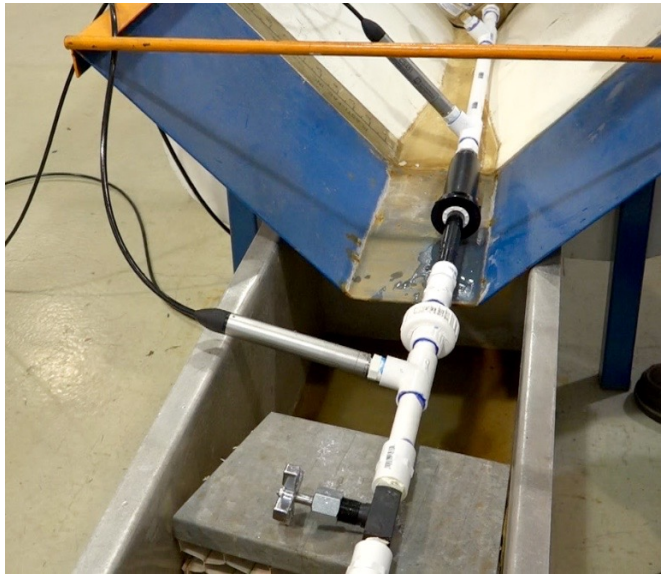
- Fall 2015 to April 2016—Each laboratory tested three models of three separate brands of spray sprinkler bodies with integral pressure regulation as well as three models of standard spray sprinkler bodies of the same brands
- Results demonstrated that the spray sprinkler bodies with integral pressure regulation were able to effectively regulate pressure and flow rate
- However, the results were inconsistent among laboratories, indicating the test method needed to be calibrated and clarified
- WaterSense subsequently revised the test method to specify that a needle valve should be used to control flow

Performance Testing

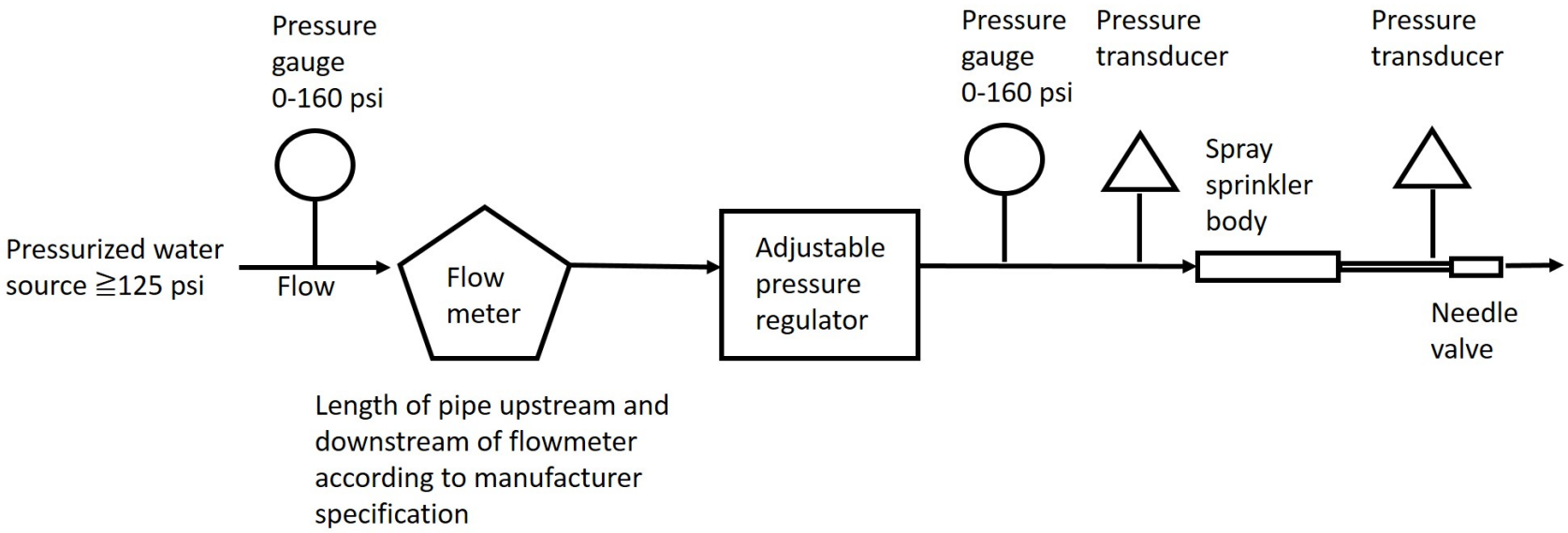
- Fall 2016—Conducted final performance testing at the University of Florida
  - Eight models with integral pressure regulation and three standard spray models using the revised test method
- Purpose
  - Further validate and refine the test protocol
  - Determine the range of product performance
  - Evaluate potential savings of spray sprinkler bodies with integral pressure regulation when compared to their standard counterparts
- Data form basis for the efficiency and performance criteria included in the draft specification and the water savings estimates described in the supporting statement

Test Process

- Verify flow rate at regulation pressure (three consecutive readings)
- Reduce pressure to zero (for at least 1 min)
- Increase pressure to regulation pressure +10 psi (3-5 min test, 30 sec recording)
- Reduce pressure to zero
- Increase pressure to 60 psi
- Reduce pressure to zero
- Increase pressure to 70 psi
- Repeat for 60 psi, regulation pressure +10 psi



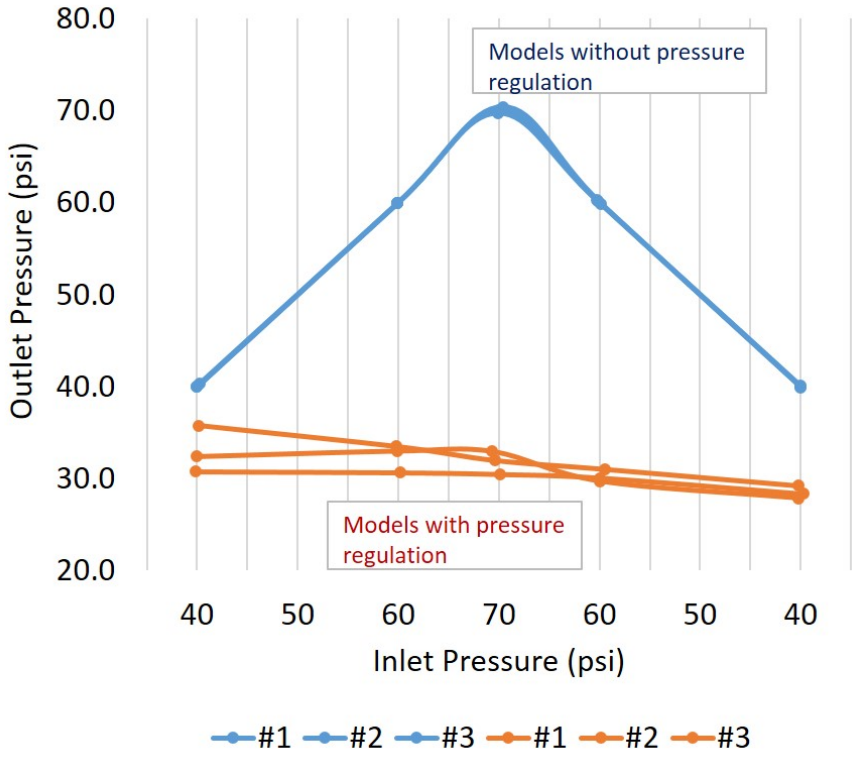
Test Setup

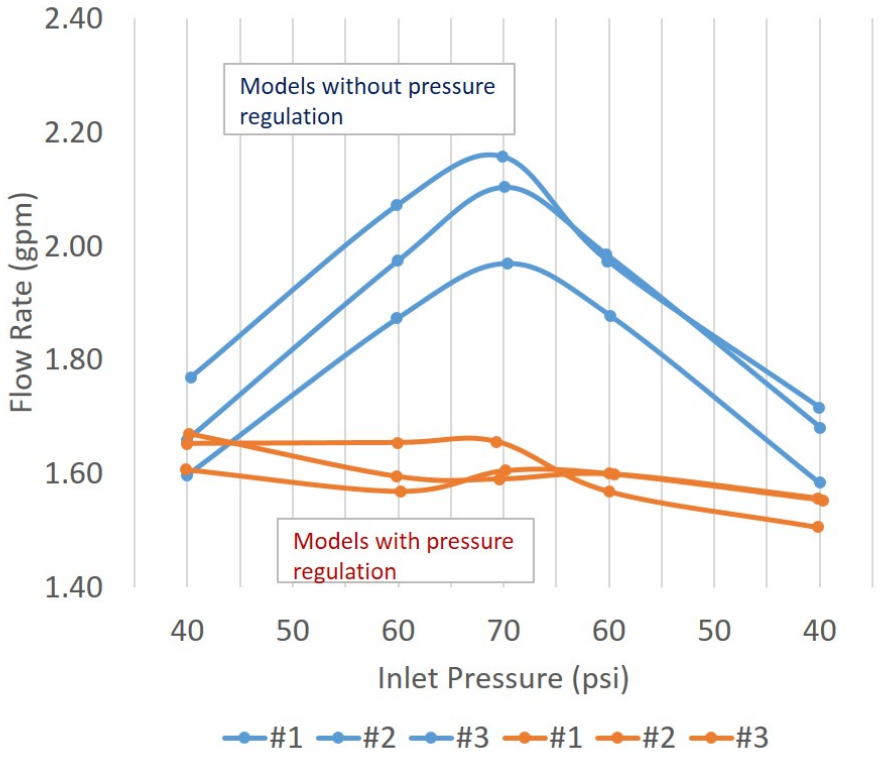


Testing video: https://vimeo.com/187571070

Results

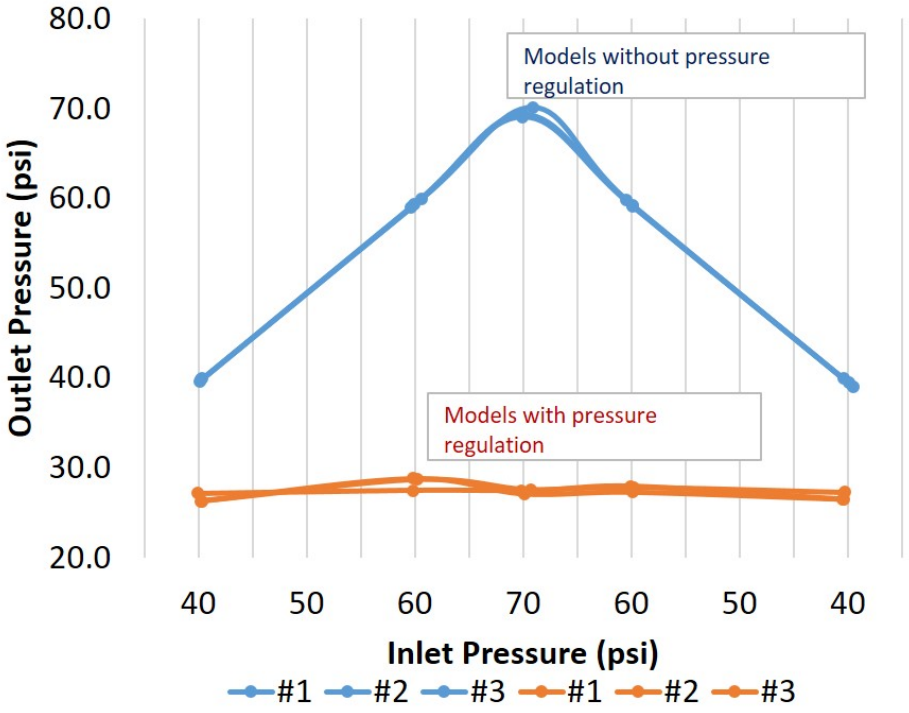
Brand A: Spray sprinkler body with integral pressure regulation vs. standard spray body
Tested at 1.5 gpm

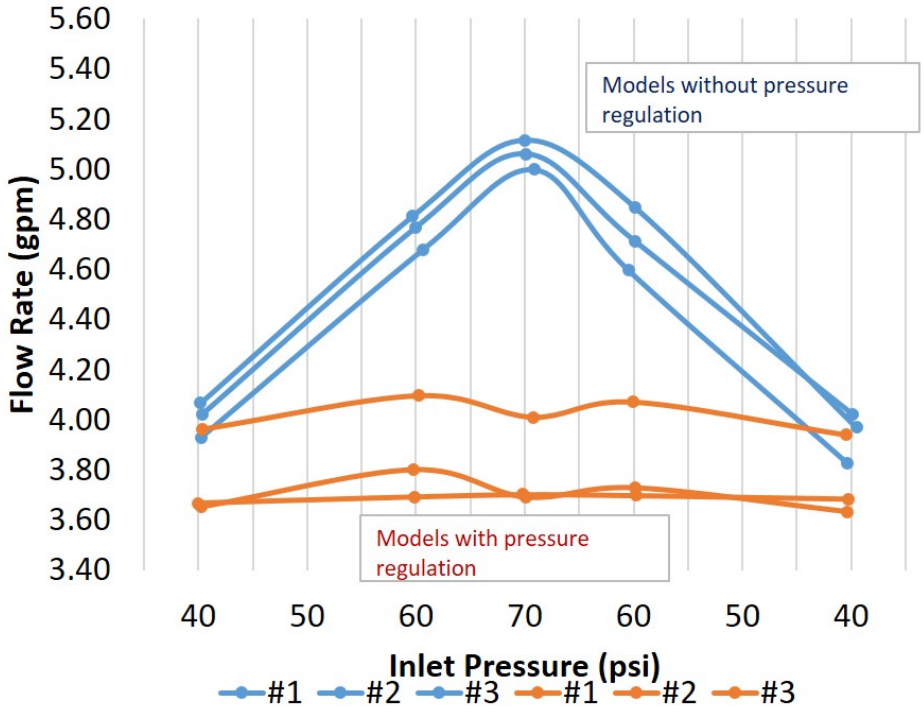




Results

Brand A: Spray sprinkler body with integral pressure regulation vs. standard spray body
Tested at 3.5 gpm



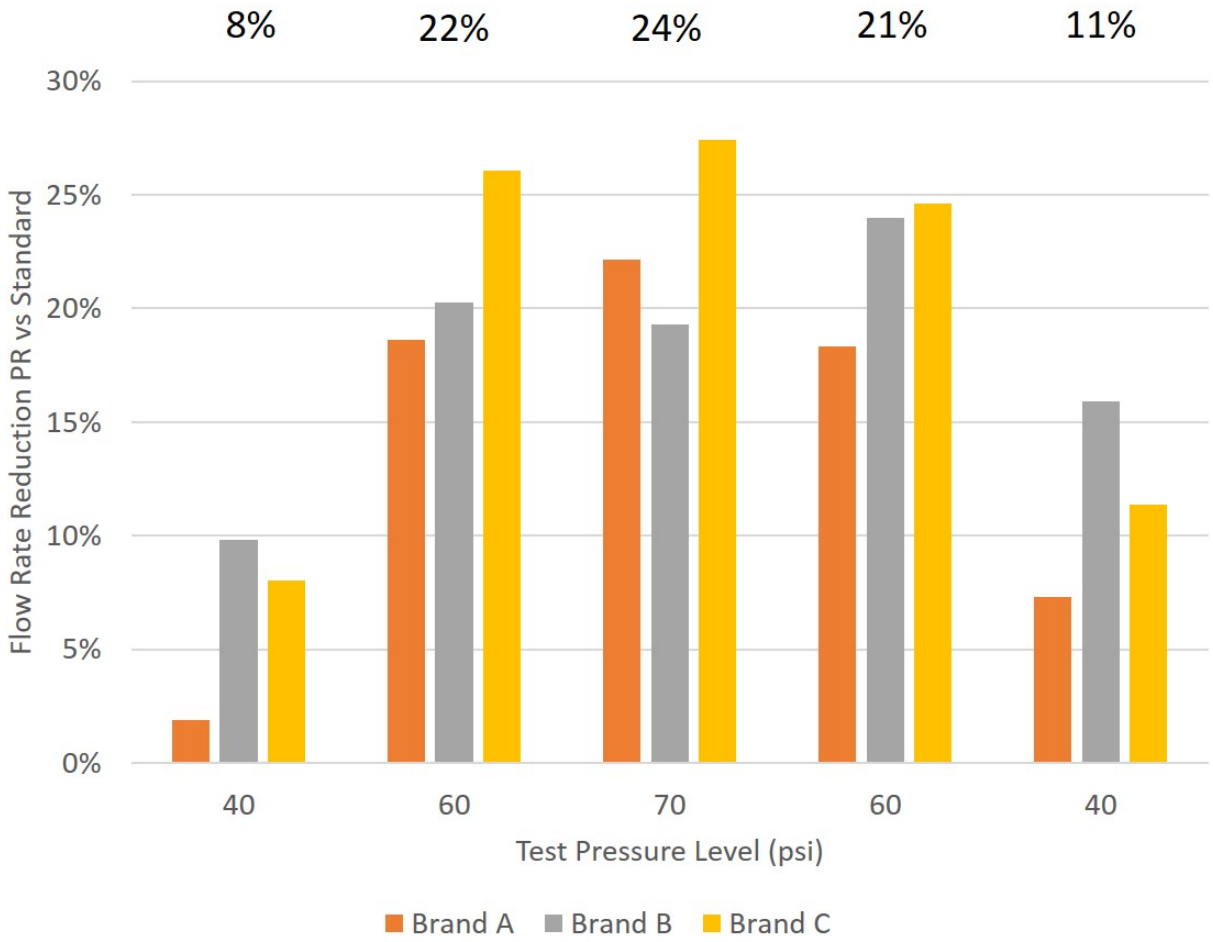


Results

look for WaterSense Meets EPA Criteria

Flow Rate Reduction = Potential Water Savings

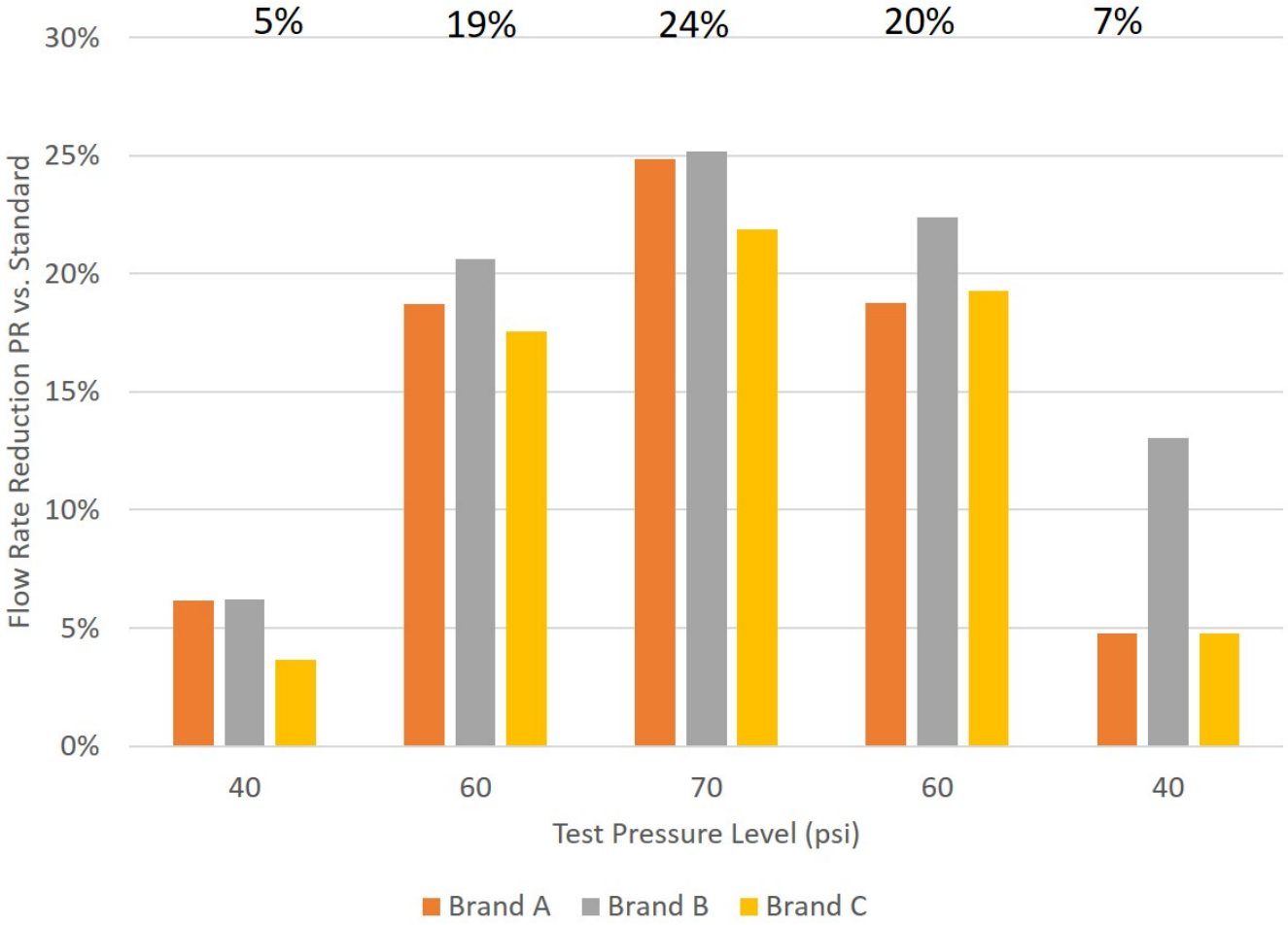
Comparison of Spray Sprinkler Body with Integral Pressure Regulation vs. Standard Spray Sprinkler Body at 1.5 gpm



Results

Flow Rate Reduction = Potential Water Savings

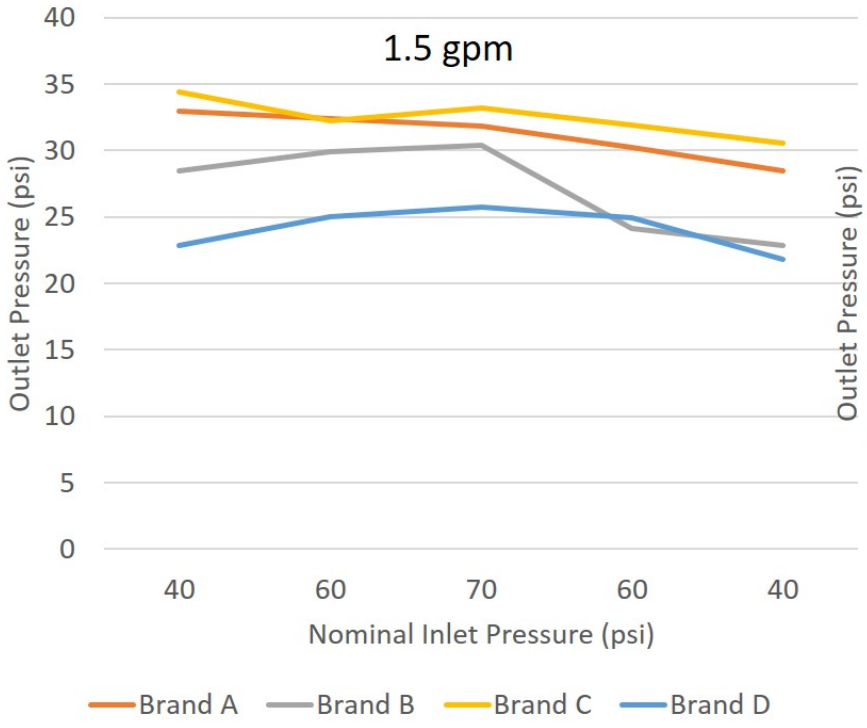
Comparison of Spray Sprinkler Body with Integral Pressure Regulation vs. Standard Spray Sprinkler Body at 3.5 gpm

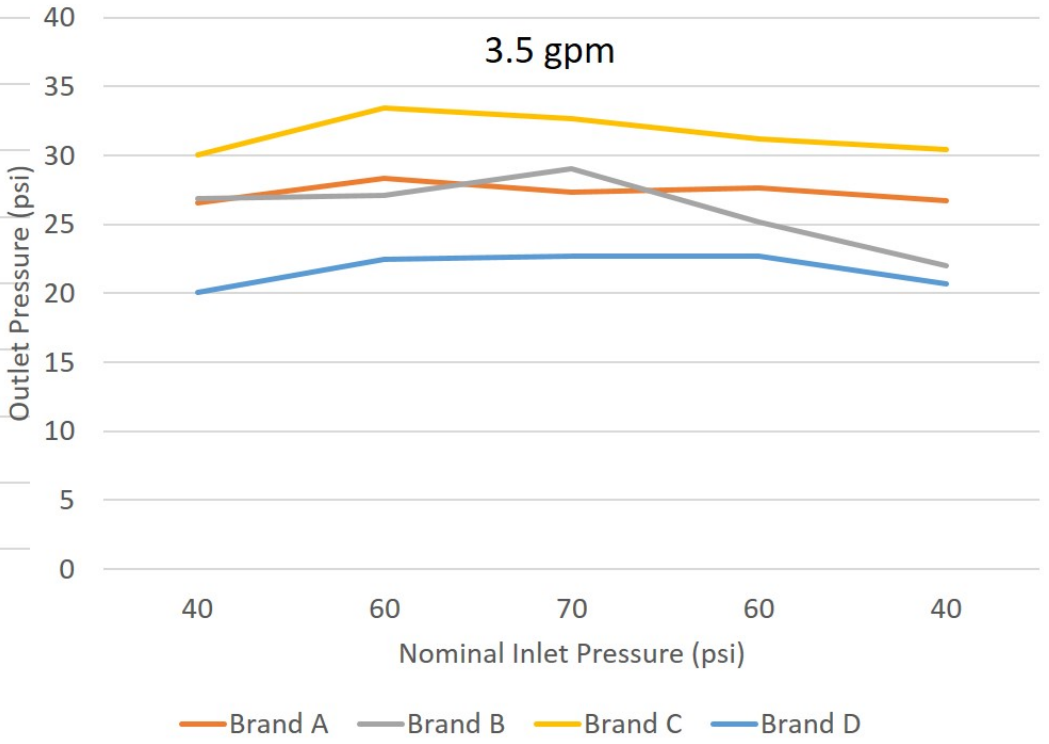


Results

look for WaterSense Meets EPA Criteria

Outlet Pressure for Spray Sprinkler Bodies with Integral Pressure Regulation



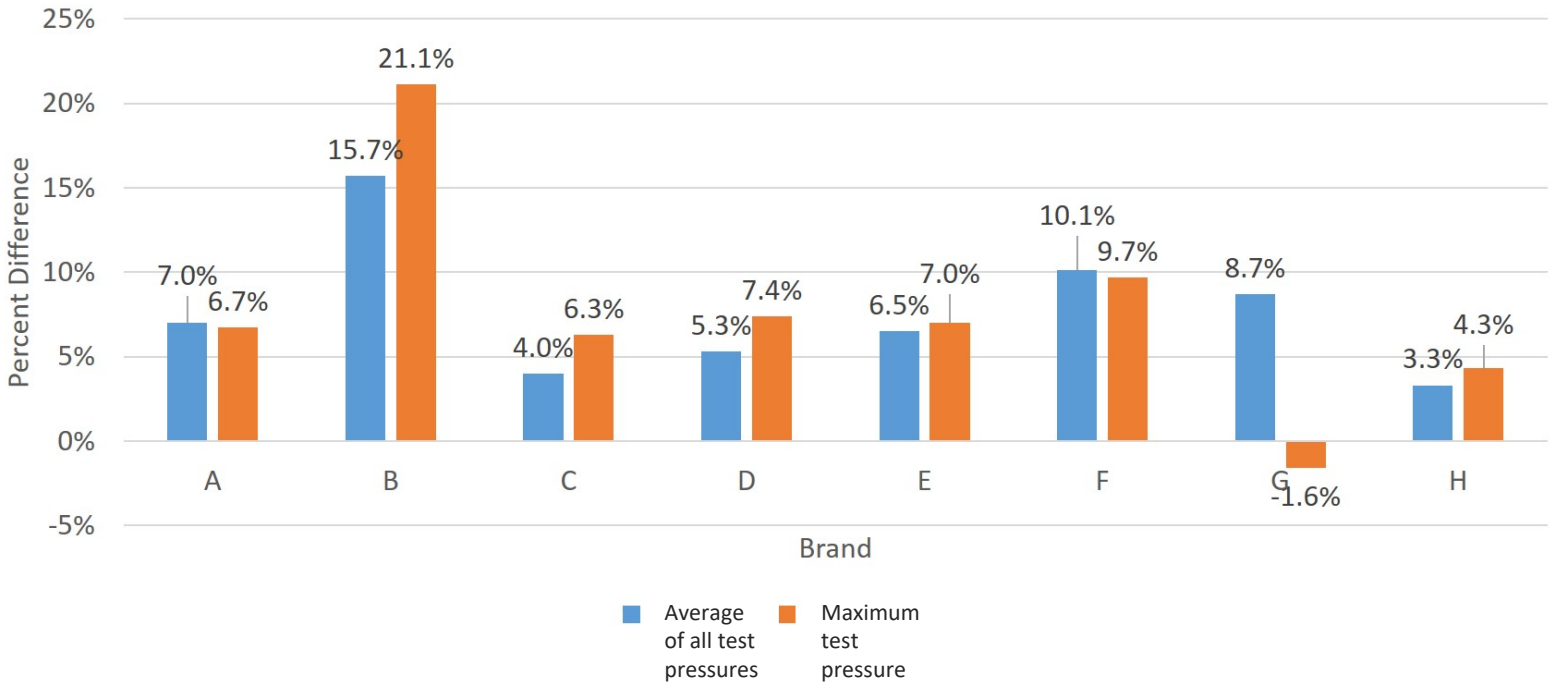


Changes to Test Method

- Based on the results, the following changes were made to the test method, resulting in the version included in the draft specification
  - Eliminated test levels in the falling limb of the pressure test level curve. Final pressure test levels include calibration point (i.e., regulation pressure), 10 psi above the regulation pressure, 60 psi, and 70 psi or the maximum operating pressure, whichever is greater
    - The falling limb data was very similar to the rising limb
    - Sprinklers are not operated up and down a curve in the field
  - Test at only one flow rate (1.5 gpm)
    - Results between 1.5 gpm tests and 3.5 gpm tests were similar
    - 1.5 gpm is specified in ASABE/ICC 802-2014 and is more commonly found in the field than 3.5 gpm

Summary Results

Percent Difference Between Flow Rate at Tested Pressure Level(s) and the Flow Rate at the Calibration Point (1.5 gpm, rising limb only)



Draft Specification for Spray Sprinkler Bodies

Scope

- The draft specification criteria for spray sprinkler bodies apply to:
  - Spray sprinkler bodies with integral pressure regulation, based on definitions in the American Society of Agricultural and Biological Engineers and International Code Council's *ASABE/ICC 802-2014 Landscape Irrigation Sprinkler and Emitter Standard*

    - Sprinkler Body—The exterior case or shell of a sprinkler incorporating a means of connection to the piping system designed to convey water to a nozzle or orifice.
    - Pressure Regulator—Device that maintains constant operating pressure immediately downstream from the device, given higher upstream pressure.

Scope

- The draft specification does not apply to the following, as defined by *ASABE/ICC 2014*:
  - Nozzles
  - Bubblers
  - Microirrigation emission device

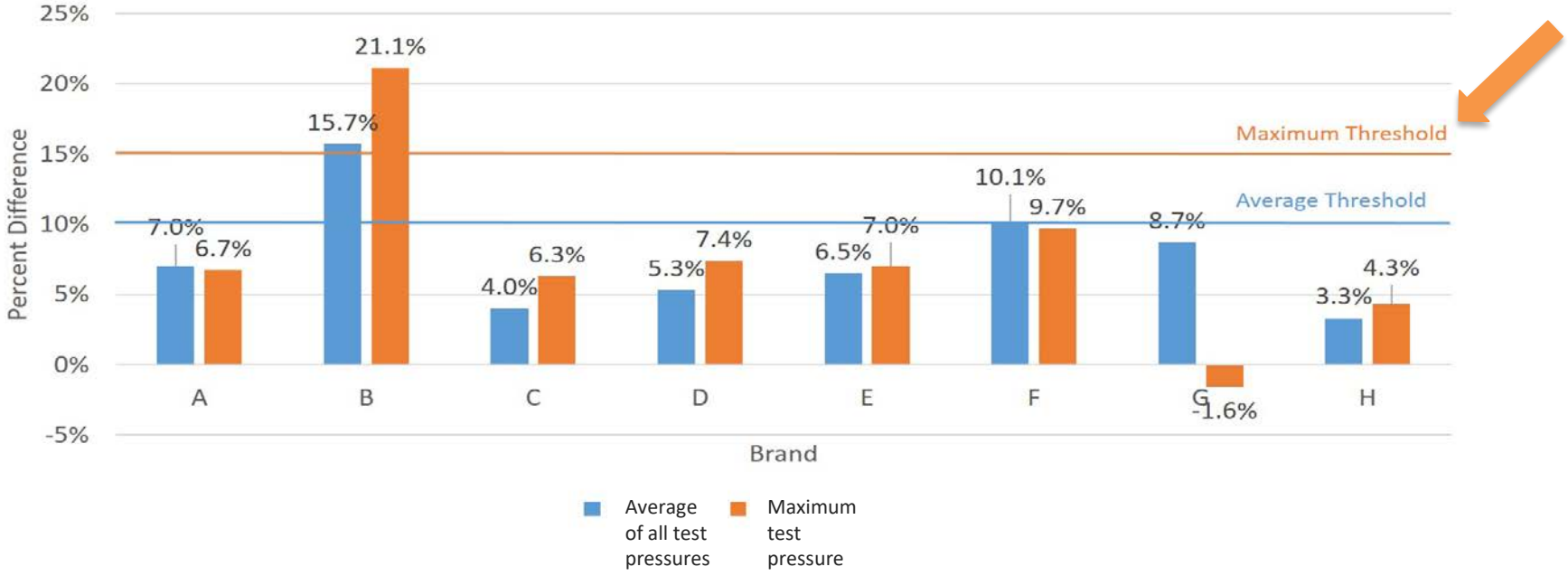
- The draft specification also does not apply to:
  - Aftermarket devices
  - Products for use exclusively within agricultural irrigation systems
  - Hose-end watering products
  - Valve-in-head devices

Questions/Discussion

- Questions/discussion?

Water Efficiency and Performance Criteria

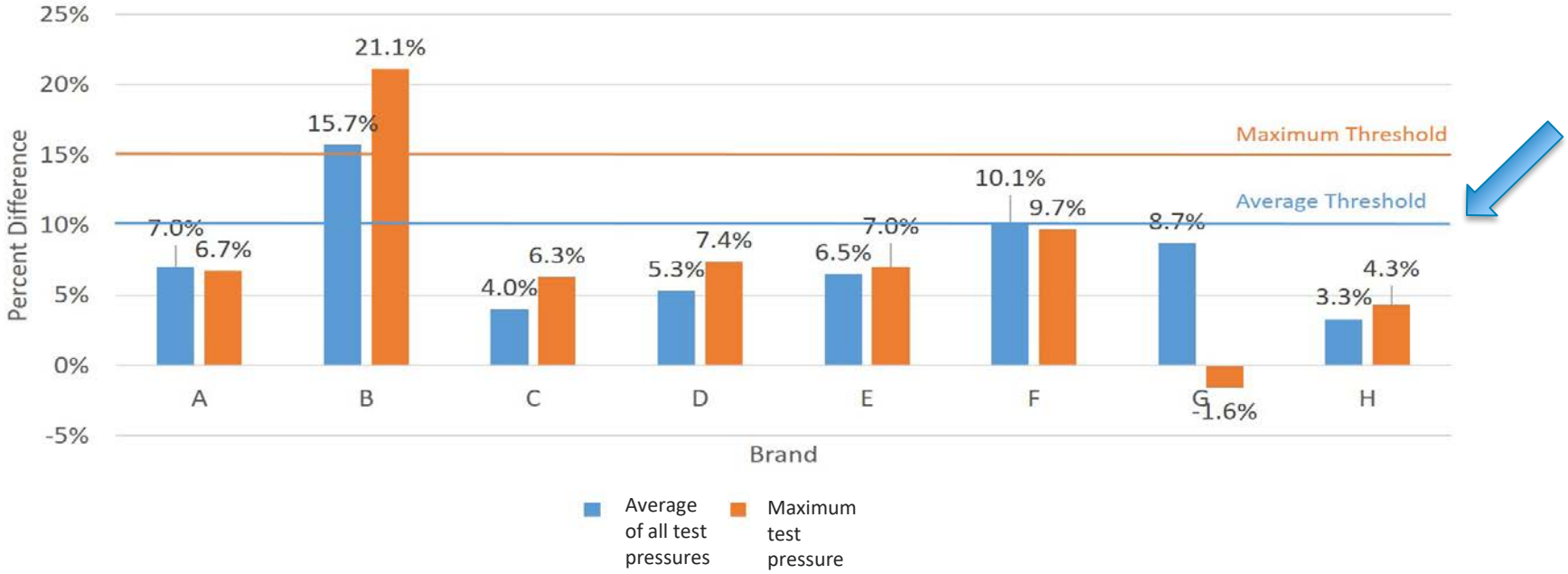
Percent Difference Between Flow Rate at Tested Pressure Level(s) and the Flow Rate at the Calibration Point



1. Flow rate at the maximum operating pressure — The percent difference between the initial calibration flow rate (as described in Appendix B) and the flow rate at the tested pressure level of 70 psi (or the maximum operating pressure, as specified by the manufacturer, whichever is greater), averaged for the selected samples, shall be within +/- 15.0 percent.

Water Efficiency and Performance Criteria

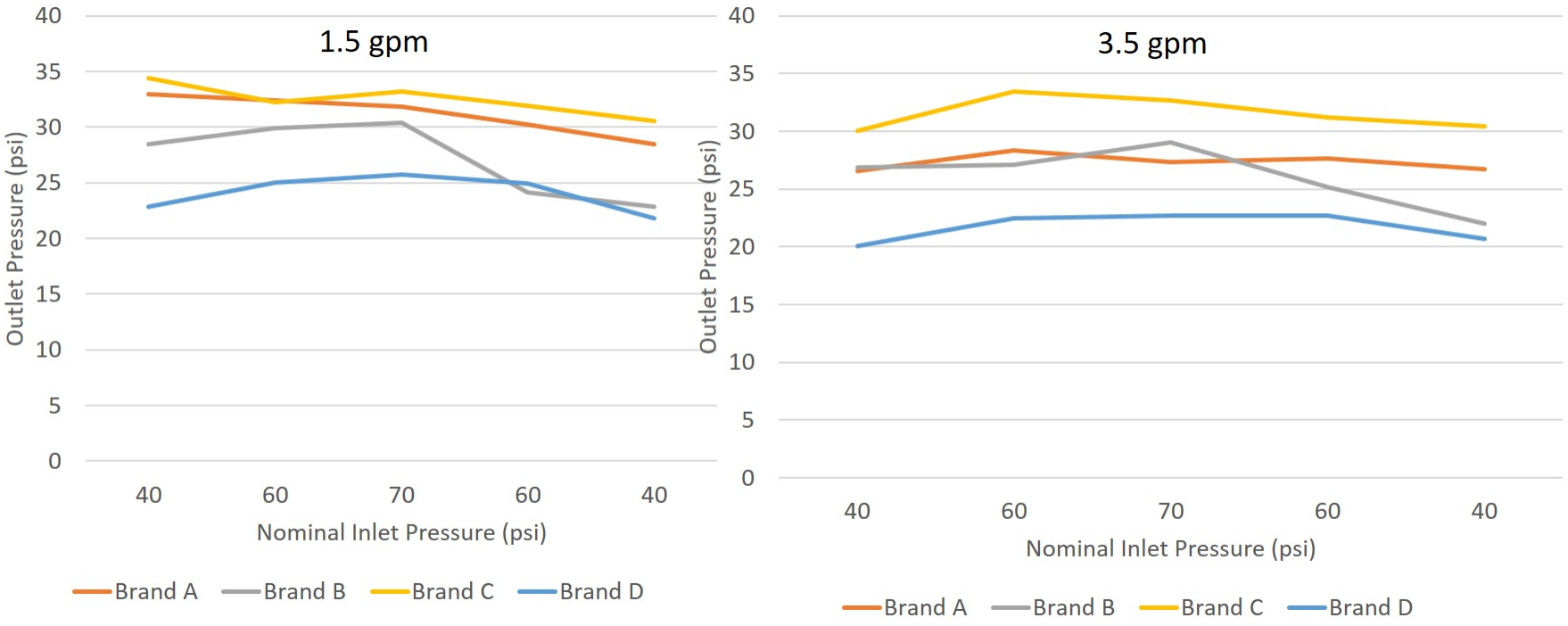
Percent Difference Between Flow Rate at Tested Pressure Level(s) and the Flow Rate at the Calibration Point



2. Average flow rate across all tested pressures—The percent difference between the initial calibration flow rate and the flow rate at each tested pressure level, averaged across all pressure levels and all selected samples shall be within +/- 10.0 percent.

Water Efficiency and Performance Criteria

Outlet Pressure for Spray Sprinkler Bodies with Integral Pressure Regulation



3. Minimum outlet pressure—The average outlet pressure at the initial calibration point of the selected samples shall not be less than 20.0 psi.

Questions/Discussion

- Questions/discussion?

General Requirements

- The sprinkler body shall meet all criteria in Section 302 of ASABE/ICC 802-2014, Sprinkler and Bubbler Design Requirements, which addresses the following:
  - Rated temperature
  - Inlet connections
  - Filters and strainers
  - Servicing
  - Adjustments
  - Burst pressure
  - Check valve function
  - Pressure regulation

Product Marking Requirements

- The specification requires conformance with all applicable subsections of Section 304.1 of ASABE/ICC 802-2014, which describe the general product marking requirements for sprinklers, including:
  - Dimension units
  - Location where the marking information should be conveyed
  - Manufacturer name
  - Size and type of connectors
  - Installation, operation and maintenance instructions
  - Location of the check valve function
  - Presence of pressure control features
  - Availability of integral flow shutoff

Questions/Discussion

- Questions/discussion?

Certification and Labeling

Certification and Labeling

- Manufacturers must sign a partnership agreement with EPA in order to have their products labeled
- All products must be certified by an EPA-licensed certifying body (LCB)
  - Approved list of LCBs will be posted on WaterSense website with the release of the final specification
- Manufacturers will apply to an LCB of their choice
- LCBs will certify product in accordance with the WaterSense specification and authorize manufacturers to use WaterSense label
  - LCBs provide manufacturers with graphic artwork of label
- Use of the WaterSense label on product packaging is required

Certification and Labeling

- A labeled sprinkler body may be packaged for sale with a nozzle or other components and the packaging may bear the WaterSense label.
- The packaging must clearly indicate which components within the package have been certified to bear the label and display their associated model number(s).

Questions/Discussion

- Questions/discussion?

Next Steps

- Submit written comments to watersense-products@erg.com by January 31, 2017
- Submit data claimed as CBI to:

  Eastern Research Group, Inc.

  Attn: WaterSense Helpline

  2300 Wilson Boulevard, Suite 350

  Arlington, VA 22201
- EPA will make public the comments received during the comment period
- Final specification issued after evaluation of public comments
- The final specification is anticipated in Summer/Fall 2017

Contact Us

EPA WaterSense

General Email: watersense@epa.gov

Comment Submission Email: watersense-products@erg.com

Website: www.epa.gov/watersense

WaterSense Helpline: (866) WTR-SENS (987-7367)