

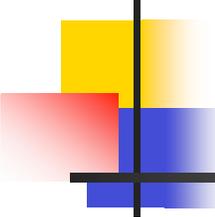
# “GREENWASHING”

## Myths, Fictions and Other Tall Tales in the Field of Water Conserving Products

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Salem OR  
May 7, 2009*

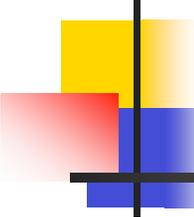




## “Greenwashing” - a new term

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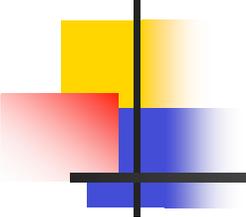
- ✓ False, exaggerated, unsubstantiated claims of efficiency and/or performance
- ✓ Promoting myths and untruths are similar to stealing...fraud upon the consumer
- ✓ Harm legitimate water efficiency efforts by heaping suspicion on all savings and performance claims



# Who should validate claims?

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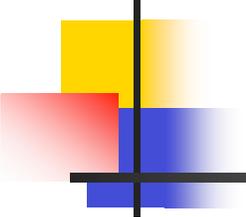
- Qualified / accredited laboratories
  - Valid testing protocol
    - Independently developed
    - Representing “real world” conditions
- Field testing & evaluation
  - “Verification by fire” = real world conditions
- Consequences of failing to test & evaluate
  - Dissatisfied customers will tamper with or replace poor performing products, and
  - Generally discredit all efficiency claims (once burnt, twice shy)



## Some prevailing “myths” ...

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- Sensors on faucets & flush valves save water
- Water-cooled ice machines use less energy than air-cooled
- Tankless water heaters save water vs. storage-type
- Washing dishes by hand is more efficient than dishwasher
- Low-flow toilets don't work
- Double-flushing low-flow toilets negates the water savings
- Alternate-day lawn watering saves water
- Automatic Irrigation Systems always save water
- Rain Barrels save water
- Dual-flush ratio of 5:1



# “Greenwashing”

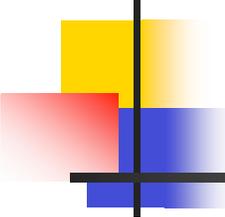
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- *verb*: the act of misleading consumers and others regarding the environmental benefits of a product or service
- “Six Sins of Greenwashing”<sup>TM</sup>

(by TerraChoice Environmental Marketing, Inc., Ottawa, Ontario)

[www.terrachoice.com](http://www.terrachoice.com)

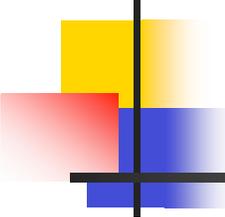




# Six Sins of Greenwashing™

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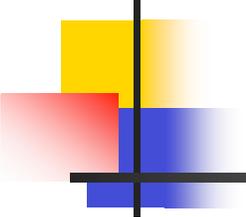
- #1 - Sin of the Hidden Trade-off
- #2 - Sin of No Proof
- #3 - Sin of Vagueness
- #4 - Sin of Irrelevance
- #5 - Sin of Fibbing
- #6 - Sin of Lesser of Two Evils



# #1 - Hidden trade-off

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- Suggesting a product or service is “green” based upon a single attribute
- Examples:
  - Non-water urinals save 100% of water
    - True, but they may require higher level of maintenance, often costs associated with replacing plastic traps, liquid seal, etc.
  - Water-cooled ice machines more energy efficient
    - Not when energy embedded in water is included
  - Tankless water heaters save water
    - Initial flow is cold, longer wait times,
    - TWHs are water wasters

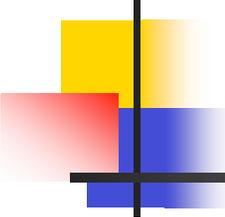


# Water-cooled ice machines

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- Recent Hoffman study: Air-cooled machines are actually responsible for less energy consumption than water-cooled ice machines
  - Considers all energy, including embedded energy in the water used for cooling
  - Download study from Alliance -

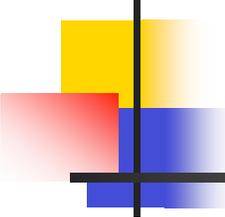
[www.a4we.org/WorkArea/linkit.aspx?LinkIdIdentifier=id&ItemID=2412](http://www.a4we.org/WorkArea/linkit.aspx?LinkIdIdentifier=id&ItemID=2412)



# Tankless water heaters

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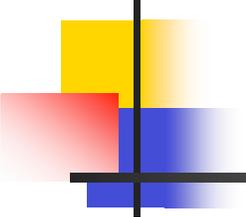
- Tank-type water heater efficiency is improving
- First flow from tankless heater is cold, usually longer wait times
  - Demand must be between minimum and maximum flow rates
- Recent Australian study:
  - “Water wastage of Gas Instantaneous Water Heaters” by Aleksander Szann
  - Waste: up to 95 L/day/home (25 gal) at the heater
- California studies:
  - Longer showers result from “unlimited hot water”
- ConsumerReports – Efficient but not necessarily economical (more expensive to purchase and install), hot water at fixture not instant



## #2 - No proof!

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- Claims that can't be substantiated by easily accessible data or by a reliable third party
- Examples:
  - Odd/Even watering restrictions save water
    - NO supporting studies. Most “experts” expect opposite
    - Usually promotes over-watering!
  - Lawns need 1-inch of water per week
    - Actual data: homes irrigate ~ 1/3”/week (manual systems)
  - Sensor-activated faucets, toilets, & urinals save water
    - All 3<sup>rd</sup> party studies show opposite (4 studies)
  - Dual-flush toilets - effective flush volume only 0.96 gpf
    - Incorrectly based on ratio: 5 reduced flushes to 1 full flush
    - Actual “real world” ratio is 2 to 1

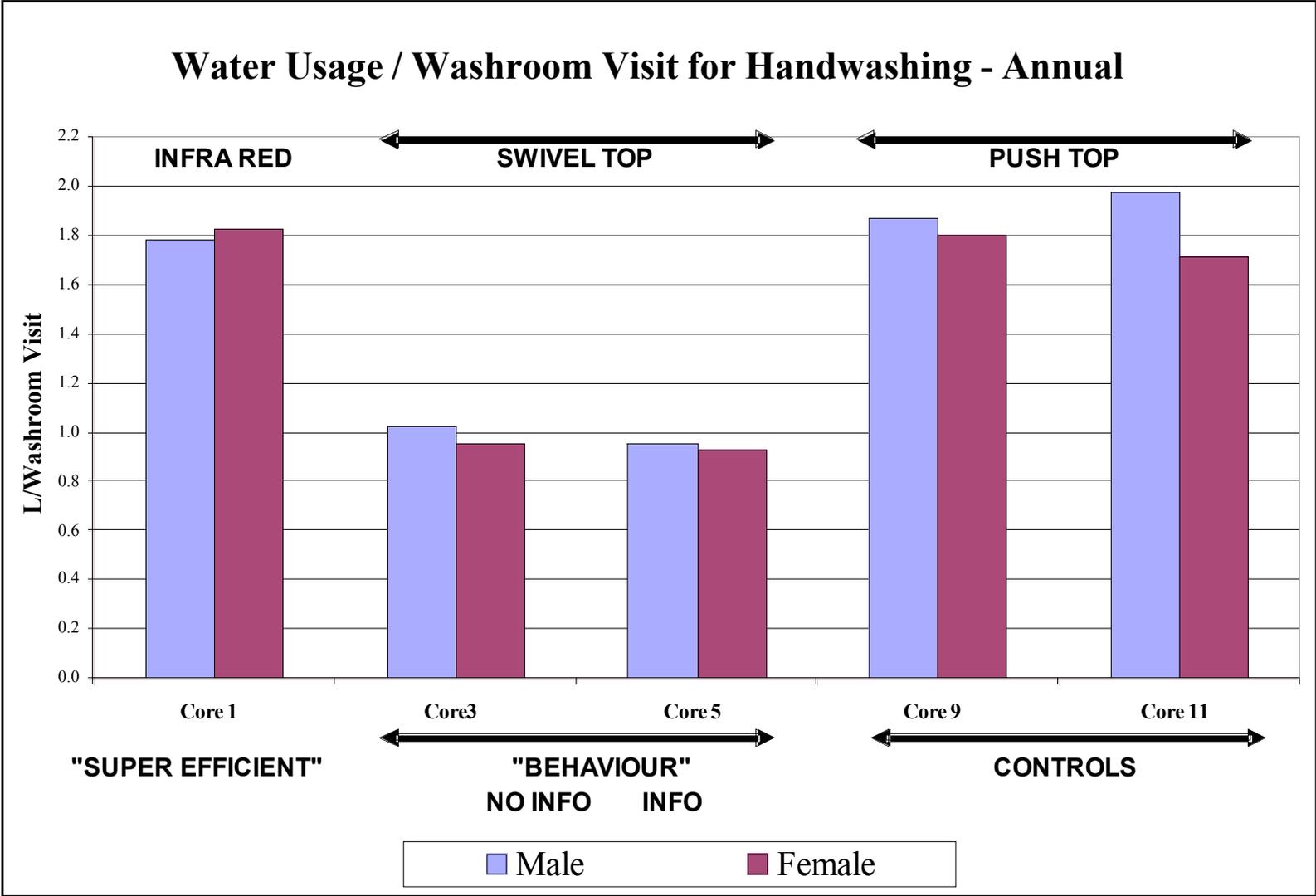


# Sensor-operated Fixtures

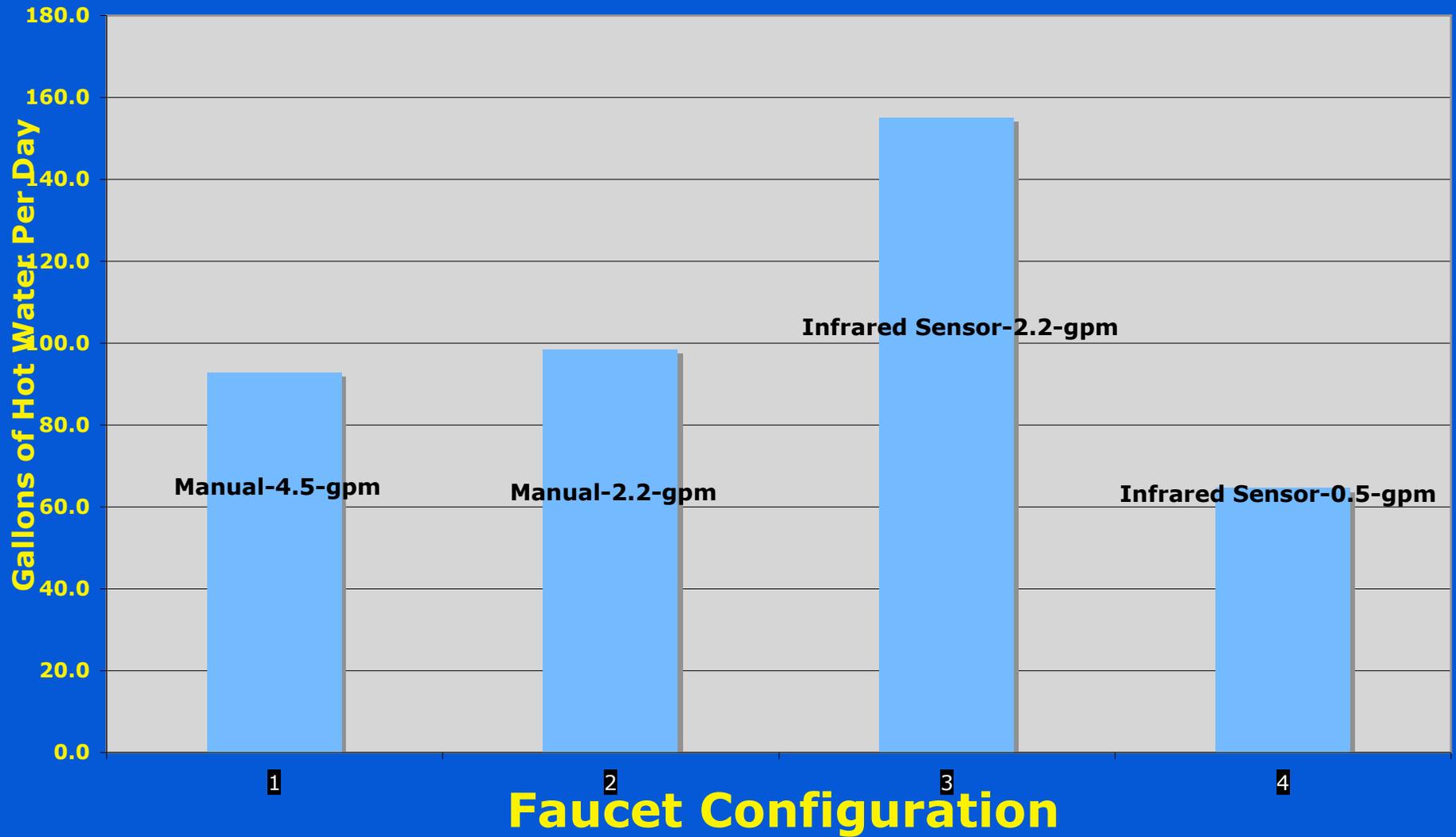
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- ✓ Four studies say otherwise...sensor vs. manual
  - **Millenium Dome, 2002 (1 yr study of 361 washbasin-faucets)**
    - Volume (per visit) was twice that of manual faucets
  - **ASHRAE, 2002 (study of 106 to 120 days use)**
    - Volume increased 58%
    - Installed low-flow aerators to finally reduce demands
  - **EBMUD, 2006-07**
    - Preliminary findings show increase of 40%
  - **Hillsborough County, Florida, 2006-8**
    - Demands increased by more than 30%

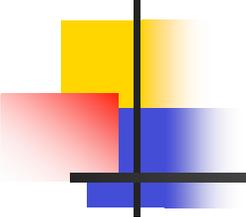
SourceSource: Hills, Birk, & McKenzie, 2002. "Millenium Dome 'WaterCycle' experiment: to evaluate water efficiency and customer perception at a recycling scheme for 6 milion visitors", Water Source and Technology



# ASHRAE Study



Source: Fanney, Dougherty, & Richardson, 2002. "Field Test of a Photovoltaic Water Heater", ASHRAE



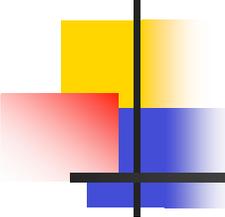
Results seem to indicate that:

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Aerators save water....

.....NOT sensors!!

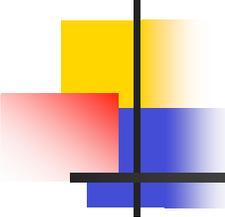
At least one manufacturer is now advertising that if you install their sensor-operated faucets in conjunction with a 0.5-gpm aerator, you will save water.



## #3 – Sin of Vagueness

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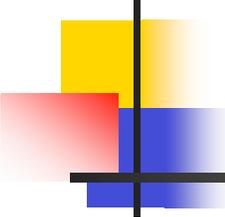
- Claims so poorly defined or broad that meaning likely to be misunderstood.
- Examples:
  - Electronic or magnetic water softeners
    - Description of operation is murky or not clear
  - Rain Barrels reduce peak summer demands
    - They can save a small volume of water, but after an extended dry period (when peak day demands occur) the barrel is likely to be empty
      - plus they typically only hold 100 to 500 L of water, or the equivalent of about 4 to 20 minutes of hose use.
        - Summer of year 1 – no rain, no water to collect
        - Summer of year 2 – much rain, no need to collect!
    - Better used as an outreach & educational tool



## #4 – Sin of Irrelevance

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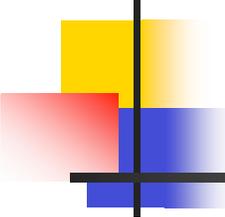
- Claim may be true – but is unimportant and unhelpful.
- Some examples:
  - Fully glazed toilet trapway
    - Prefer toilet with glazed trap that flushing 100g of waste or one with unglazed trap flushing 800g?
  - Toilet can flush 25 golf balls!
    - Next time I need to flush golf balls, I'll buy this toilet!



## #5 - Fibbing

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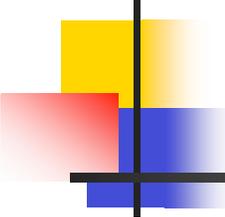
- Making environmental claims that are simply false (usually representing that a product is “certified” by an independent agency or organization)
- Examples:
  - LEED-certified products
    - There are no LEED-certified products
  - Energy Star-certified products
    - DOE does not test products for compliance; no certification
    - Manufacturers test own products with no independent verification. Program relies on manufacturers to test competitors’ products and identify suspicious claims.



## #6 – Lesser of 2 Evils

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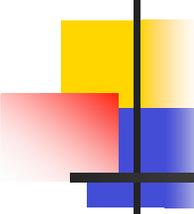
- “Green” claims that may be true but that distract from Big Picture
- Examples:
  - Organic cigarettes
  - Smart Irrigation Controllers reduce summer irrigation by up to 20%
    - vs. uncontrolled automatic systems which typically use more water than manual systems. Best option for residential market - manual irrigation (hose draggers) or native landscape.
  - Every head in our *Shower-Tower-of-Power* is efficient
    - Even though there may be 10 showerheads



# Why do “myths” occur?

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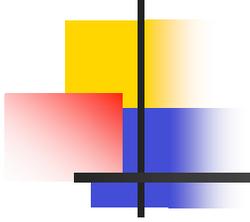
- Some myths develop unintentionally and were never meant to confuse or mislead consumer
  - based on “gut feelings”, don’t know how to verify, too lazy to verify, believed what others tell you, want to believe, etc.
  - e.g., odd/even day watering restrictions
- Some myths developed intentionally to support marketing programs (i.e., to “sell” products or services)
  - Provide either little/no technical support, or questionable “engineering” estimates
  - e.g., sensor-operated fixtures, dual-flush ratio of 5:1
- Sometimes results are “exaggerated” to make program appear more successful



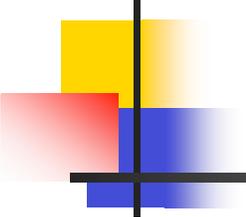
# Problems with “Myths”

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- No independent field or lab analysis
- Reliance upon “engineered” estimates
- Invalid test results & studies
  - Unscientific
  - Non-representative products
  - Lacking statistical validity
- Failure to complete a Life Cycle Analysis
- Glamorizing only the “successes”
- Being “romanced” by the salesman



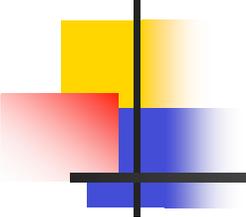
# Product Testing



# Why test?

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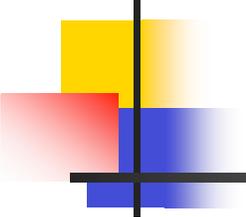
- Establish that a product meets minimum requirements for certification
- Measure performance and efficiency
- Verify that a product works on a continuing basis and meets the intent of the product
- Compare one product with another product with a similar purpose
- Ascertain water use and water savings



# “Depth” and scope of testing?

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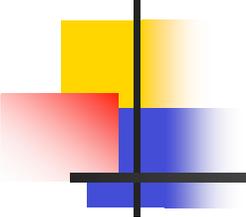
- Guesstimate
- Engineered estimate
- Laboratory test (before entering the marketplace)
- Field test (trials before entering the marketplace)
- Field test (sampling of product after installation and commissioning)
- Field test (sampling of “aged” installations, e.g., after 6 months, 1 year, 5 years, or ?)



# What types of testing?

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- Statistically valid testing
- Certification testing to a minimum standard; testing only for compliance
- Manufacturer testing
- Performance testing (fit for purpose), including Maximum Performance (MaP) testing
- Independent testing
- Laboratory testing
- Field testing
- Measurement & verification testing



# Decisions, decisions....

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✓ WHO should test?

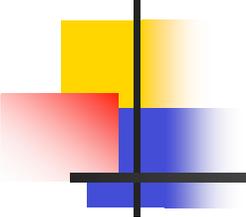
- Manufacturer
- Independent laboratory
- Customer

✓ WHAT should be tested?

- Product as a “stand-alone”
- Product within a “system”

✓ WHEN to test?

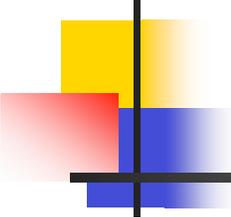
- Before the product is introduced to the marketplace
- After the product has been installed (at commissioning)
- During the lifetime of the product to establish durability and consistency



# Verifying that products perform...

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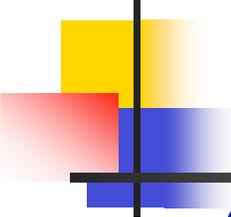
- Many independent studies completed or underway
  - Funded by dozens of water utilities & municipalities in U.S. & Canada
- Alliance for Water Efficiency = a clearinghouse for future studies of products and technologies...
  - Verify performance
  - Verify water use
  - Verify durability & sustainability
  - Develop specifications
  - Educate consumers, trades, & specifiers on water-efficient products and practices



## What's next?.....Emerging technologies & practices needing further study

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- Graywater treatment systems-resid & comm'l
- Building comfort (HVAC) systems & technologies
- Residential hot water distribution systems
  - manifold systems, hot water recirculating & demand systems
- Multi-family sub-metering systems
  - 14% water savings
- Sensor-activated faucets (resid & comm'l)
- Commercial non-water urinals

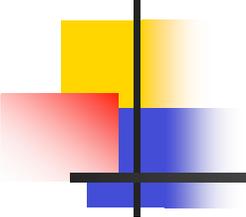


# Special Projects

to define water/energy savings and/or performance

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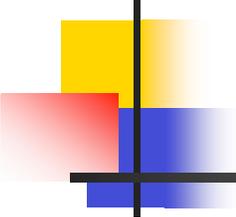
- Completed during 2005 - 2009 -
  - ✓ Comm'l food steamer field study by Food Service Tech Center
    - Boilerless-connectionless food steamers
    - Basis for extensive rebate programs in Calif & elsewhere
  - ✓ Commercial flushometer valve & toilet study (49 combinations)
  - ✓ Drainline waste transport studies - residential & commercial
    - Used by U.S. EPA in WaterSense program
  - ✓ Showerhead & shower systems study by LBNL
  - ✓ MaP Testing - 13th Edition - 840+ toilet fixture models performance tested & rated
  - ✓ Commercial ice-machine field study by EBMUD & Seattle
  - ✓ Sensor-activated faucet field study by EBMUD
  - ✓ Residential multi-family submetering study



# Current Studies: Plumbing Products

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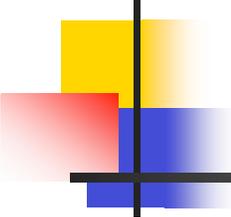
- Flushometer Valve Toilet Fixture Performance Study
  - ✓ Various HET combinations
  - ✓ Developing MaP protocol for flushometer combinations
  - ✓ Completion planned for mid-2008
  - ✓ Will serve as foundation for WaterSense Program
- PERC Building Drainline Study
  - ✓ National coalition (AWE, PMI, ICC, IAPMO, PHCC)
  - ✓ Waste movement in building drainlines



# Other Current Field Studies: Plumbing Products

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- Commercial Urinal Performance Study
  - ✓ Various High-Efficiency Urinals (HEUs), including waterless
  - ✓ 2 locations - Seattle Washington and Region of Peel (Ontario)
  - ✓ Completion planned for 2009
  - ✓ To evaluate water use reduction, drainline impacts of reduced flows, and maintenance requirements
- Commercial Sensor-Activated Valve Study
  - ✓ Location - Florida
  - ✓ Measuring faucets and flushometer valves
  - ✓ Determine if sensors decrease or increase water use
  - ✓ Completed in 2008 - documentation to follow...



# Other Special Projects

to define water savings and/or performance

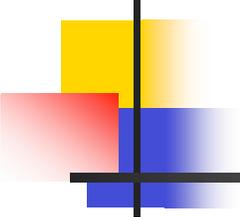
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- Studies now UNDERWAY or PLANNED
  - ✓ Pre-rinse spray valves: new efficiency thresholds  
(reducing flows to as low as 0.8 gpm)
  - ✓ Showerhead specification development - residential  
(by ASME/CSA - WaterSense - Calif Energy Commission)
  - ✓ Showerhead customer preferences  
(by Gauley/Koeller - Univ's of Waterloo & Florida)
  - ✓ Salon spray study (by Puget Sound Energy)
  - ✓ Residential hot water distribution field study  
(in new homes - by LBNL)

# What to do...

- Don't let your desires cloud your intellect
- Be diligent & look for...
  - ✓ Independent field and lab studies
  - ✓ WaterSense<sup>®</sup> label or certification
  - ✓ Legitimate customer feedback & surveys
  - ✓ Authoritative data from independent sources
    - Water utilities
    - Other independent evaluators
    - Water efficiency professionals
- ...and, **DON'T BE 'ROMANCED' BY THE SALESPERSON!!**





Thank you...

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*for the*

**Alliance for Water Efficiency**

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