

WATER CONSERVATION

Green Restroom Products
By Paul DeBoo



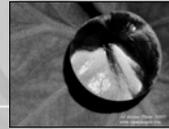
September 2005

Overview

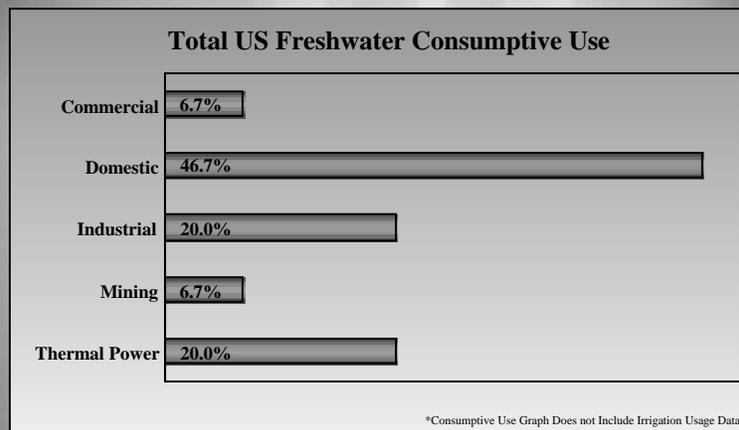
- **Facts about water and water use in the United States**
- **Movement toward “Green Building” and programs that outline ways to save water**
- **Overview of products – including performance testing information**
- **Product summary – what to look for when buying “green”**

Water Facts: Saving Is Important

- **Water is essential a limited natural resource** - 3% of the Earth's water is freshwater and only 1% is available for human consumption. The rest is frozen in the polar regions.
- **Shortages due to droughts, floods, and increased demand** - Since 1950 the US population has grown by 88% but water usage has increases 207%. (1950 – population - 150 million, water – 14 billion gallons per day. 2000 – population 282 million, water 43 billion gallons per day.)
- **Rising water and sewer costs** – Increasing on an average rate of 4% annually.

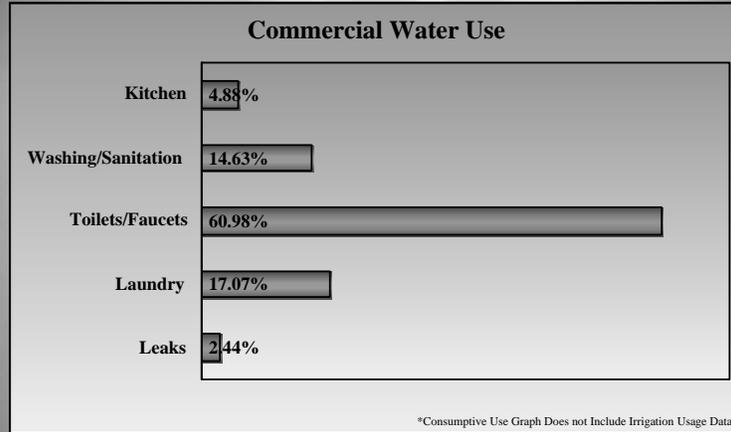


How We Consume Water



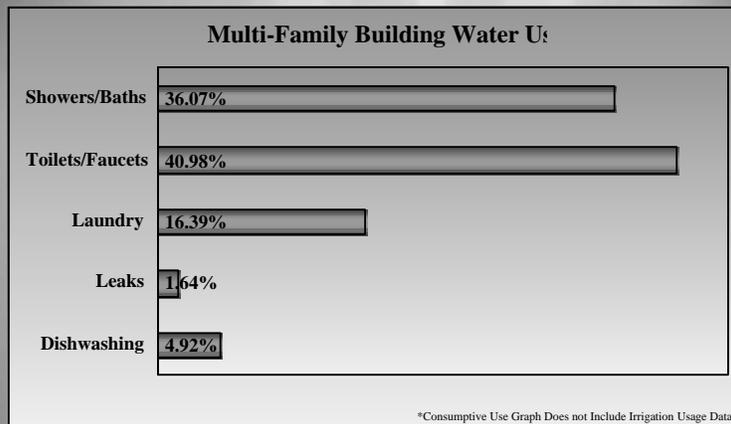
Consumptive Water Use – Water withdrawn that is evaporated, transpired, incorporated into products or crops, consumed by humans, or otherwise removed from the immediate water environment.

Indoor Commercial Water Use



Denver Water Administration Building
1600 W. 12th Ave.
Denver, CO 80204-3412

Indoor Multi-Family Water Use



Denver Water Administration Building
1600 W. 12th Ave.
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Growing Trends

The Green Building Movement

Green Building Rating Standards That Encourage Water Conservation



- **SPiRiT** (US Army's Sustainable Project Rating Tool)
- **EPA Water Efficiency Program** (Similar to Energy Star)





- **Leadership in Energy & Environmental Design.**
- **Flagship product produced by the United States Green Building Council**
- **A rating tool to guide the process of building and certifying a green building**

Benefits of Green Building

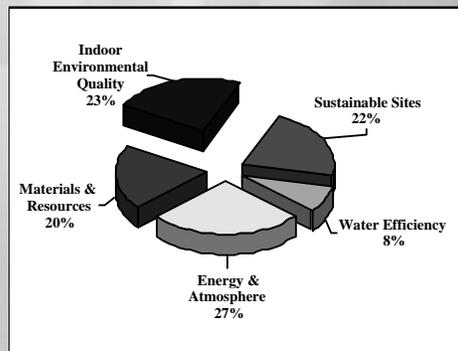
- **Environmental benefits**
 - ✓ Reduce the impacts of natural resource consumption
- **Economic benefits**
 - ✓ Improve the bottom line
- **Health and safety benefits**
 - ✓ Enhance occupant comfort and health
- **Community benefits**
 - ✓ Minimize strain on local infrastructures and improve quality of life

Technical Overview of LEED®

- Whole-building approach encourages and guides a collaborative, integrated design and construction process
- Optimizes environmental and economic factors
- Four levels of LEED certification:
 - ✓ Certified Level 26 - 32 points
 - ✓ Silver Level 33 - 38 points
 - ✓ Gold Level 39 - 51 points
 - ✓ Platinum Level 52+ points (69 possible)

What is “Green” Design?

- Design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas:



Water Efficiency

- **5 possible points**
 - ✓ **2 landscaping points**
 - ✓ **1 wastewater innovation point**
 - ✓ **2 indoor water use points**

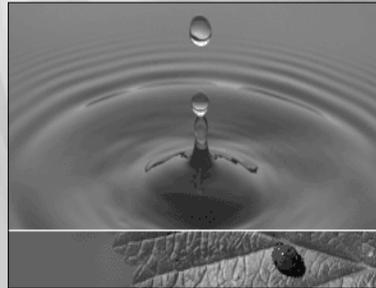


Federal Maximum Water-Use Standards -EPAct

- **Toilets – 1.6 gallons per flush (gpf)**
- **Urinals – 1.0 gpf**
- **Showerheads – 2.5 gpm**
- **Kitchen and Lavatory Faucets – 2.5 gpm**
- **Metering Faucets – 0.25 gal. per cycle**

Water Use Reduction

- **Credit 3.1 and 3.2**
 - ✓ 20% reduction – 1 point
 - ✓ 30% reduction – 1 additional point



Qualifying Requirements

- **Baseline Calculations**
- **Design Case Calculations**
- **LEED Letter Template signed by MEP**
- **Spreadsheet calculations demonstrating reductions**

Government Sponsored Conservation Activity

EPA Activity

- **Water Efficiency Mark for Products – Similar to the EPA’s Energy Star Program**
- **Rating system for water consuming products**
- **Consumer Products then Commercial**
- **Starting with Washing Machines and Dishwashers**



Local Government Programs

- Tax Incentives
- Residential and Commercial Rebate programs for toilets, showerheads, and aerators



So many products
How To Chose...



Choosing Toilets

- **EPAct limit of 1.6 per flush (min. req.)**

Conventional Gravity

Vacuum Assist

Pressure Assist

- **Dual-flush toilets (20% reduction)**

1.6 and 1.1 gpf system

- **<1.0 GPF toilets (33% reduction)**

- **Incinerating toilets (100% reduction)**

- **Composting toilets (100% reduction)**



Kohler's Cimarron Class Five™

Testing of Toilets

- **Veritec Consulting with Koeller and Company**

- **MaP - Maximum Performance Testing**

— Report released May 2004



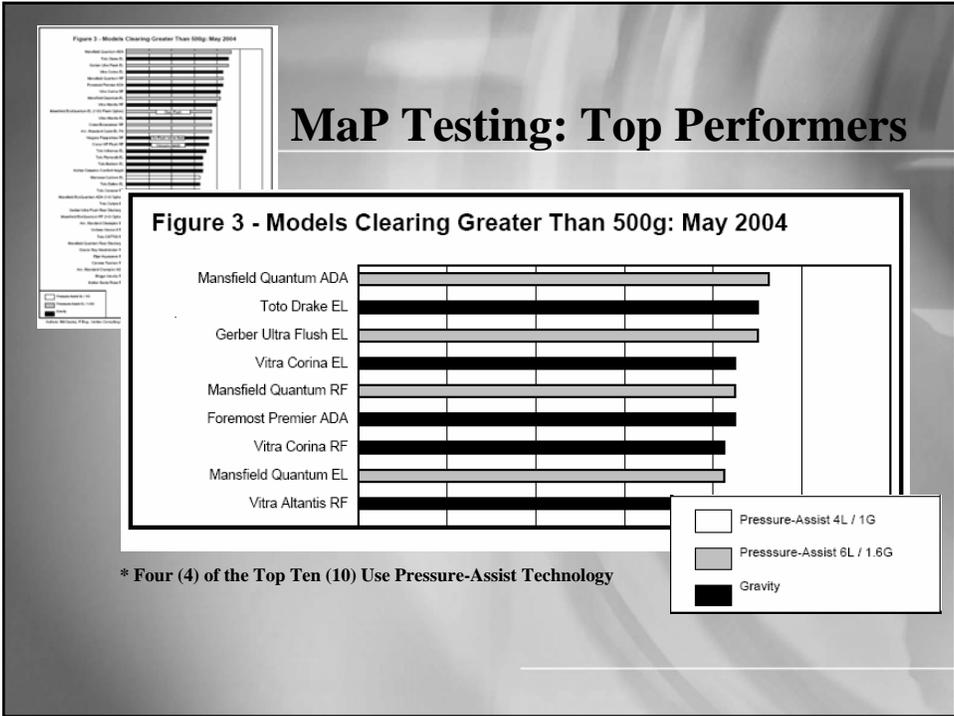
MaP Test Minimum Performance

The minimum extraction performance, set at **250 grams of soybean paste**. Replicates the maximum average of fecal waste of the male population that participated in a British medical study*.

*Variability of Colonic Function in Healthy Subjects

Results

- Flushed less than 250 grams: 20 models
- Flushed 250 to 500 grams: 13 models
- Flushed in excess of 500 grams: 11 models



High Performance Toilets

- American Standard Champion
 - 3" Flush Valve
 - MaP Results 500g



High-Performance Toilets



Kohler Cimarron



Kohler Cimarron

- 3-1/4" flush valve
- MaP Results
 - 675g @ 1.6 gpf setting
 - 450g @ 1.4 gpf setting

Pressure-Assist Toilets



Sloan *FLUSHMATE* IV 1.0 gpf

- Air compressed as inner tank refills
- Compressed air increases flush velocity
- MaP Results
 - 925g @ 1.6 gpf
 - 650g @ 1.0 gpf

MaP Test Results (grams) Pressure-Assist

Pressure-Assist Models

Mansfield Quantum ADA	925 g
Gerber Ultra Flush PA	900 g
Mansfield Quantum RF	850 g
Mansfield Quantum EL	825 g
American Standard Cadet PA	750 g
Crane Economizer	750 g

For complete list: www.cuwcc.org/uploads/product/map_final_report.pdf

Dual Flush Toilets



Caroma dual-flush Caravelle

- **Widely used in Europe and Australia**
- **1.6 gpf button for flushing solids, MaP results 500g**
- **1.0 gpf for liquids and paper**

Composting Toilets



Chesapeake Bay Foundation

- **Great water saving potential – no water use**
- **Human waste converts into humus that can be used on non-food plantings**
- **Products available from at least a half-dozen manufactures**

Composting Toilets

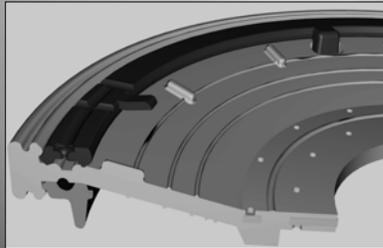


- Ranging from simple twin chamber designs through to advanced systems with rotating tynes, temperature and moisture probes and electronic control systems.
- Effective biological converters of “waste”
- Saves water and starts regeneration

Commercial Flush Valve Toilets

Manual Operation

- **New Low Flow Valves**
1.6 gpf, dual flush, and 1.2 gpf
- **Reliable**
- **Filtered Bypass**



Automatic Flush Valves

- Sensor Operated
- Hardwired
- Battery Retrofit



Water Saving Urinals

- **New Low Flush - 0.5 gpf Urinal Valves**
- **Retrofit Kits Save Water**
- **Waterfree Urinals**



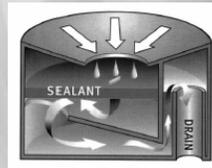
Waterfree Urinals



100% Water Savings

Uses replaceable cartridge with oil based sealant for trap seal.

Separates urine during use and directs it down drain.



Sensor Faucets Save Water



- Study's indicate that sensor faucets save as much as 70%*
- Only dispense when user needs water
- Increased reliability

*Texas A&M Study



Manual Faucets/Low Flow Aerators

- Easy to maintain
- Metering
- 0.5 spray head aerators
- Foot Pedal Controls



Showerheads

- Low-flow Showerheads can reduce flow rates from around 5 gpm to 2 gpm or less, and are inexpensive to install.
 - ✓ Hot water use for an average shower can be reduced from around 50 gallons to 20 gallons or less.
 - ✓ There are a wide variety of low-flow showerheads available, including the popular pulsating or "massage" type.
 - ✓ Some of these showerheads incorporate a valve or pushbutton that interrupts the water flow while "soaping up", saving even more.



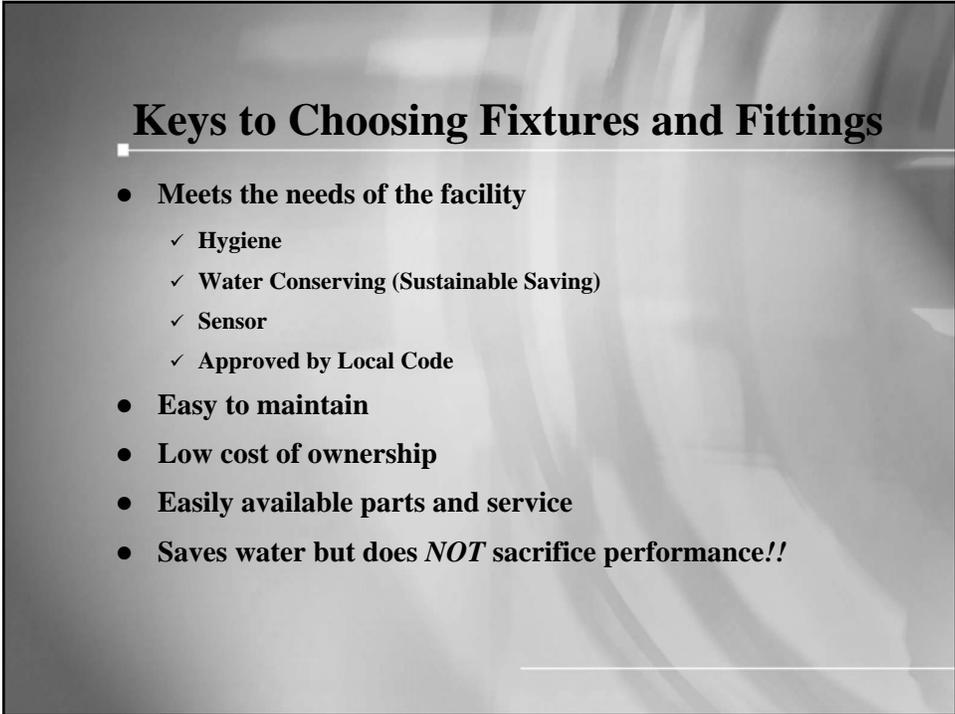
Instantaneous Water Heaters or Hot on Demand Systems

By eliminating the wait period for hot water, studies have proven these devices can save water.





Considerations When Choosing Product



Keys to Choosing Fixtures and Fittings

- **Meets the needs of the facility**
 - ✓ Hygiene
 - ✓ Water Conserving (Sustainable Saving)
 - ✓ Sensor
 - ✓ Approved by Local Code
- **Easy to maintain**
- **Low cost of ownership**
- **Easily available parts and service**
- **Saves water but does *NOT* sacrifice performance!!**

Thank You



For More Information
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