

# Ultra-Low-Flow Faucets

[STRATEGY]

## BRIEF DESCRIPTION

The U.S. Energy Policy Act of 1992 requires that all faucet fixtures manufactured in the United States restrict maximum water flow at or below 2.5 gallons per minute (gpm). Ultra low-flow faucets produce 0.5 to 1.5 gallons of water per minute, reducing water usage from 40 percent to 70 percent. Ultra low-flow faucets are designed to be as effective as conventional faucets.

## Applications

Barracks, Residential Settings, Hotels, Office Buildings, Community Centers, Gymnasiums, Hospitals, Dining Facilities

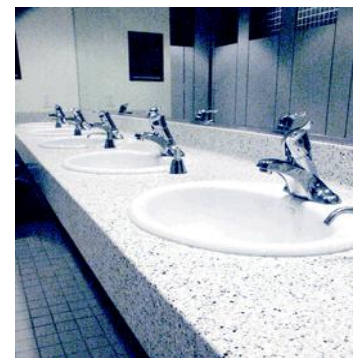
- For use in all locker rooms, restrooms and kitchens where faucets are utilized.



(a)



(b)



(c)

(a) Aerator Attachment (Source: <http://www.niagaraconservation.com/Aerators.html> )

(b) Ultra Low-Flow Faucet with Automatic sensor (Source: [http://www.us.kohler.com/onlinecatalog/newproducts\\_detail.jsp?section=2&prod=Insight%20-%20NP](http://www.us.kohler.com/onlinecatalog/newproducts_detail.jsp?section=2&prod=Insight%20-%20NP) )

(c) Ultra-Low Flow Faucets in Restroom (Source: <http://www.sonoma.edu/campusrec/aboutus/sus.conservaion.html> )

- Design and installation of ultra low-flow faucets is similar to that of conventional faucet, requiring no special connections or fittings.
- Simple aeration attachments are available for retrofitting to threaded faucets.
- Automatic sensors can be incorporated with low-flow faucets to enhance water efficiency strategies.

## Design Notes

### Hot Water

- Lower flow of water can increase the amount of time it takes for hot water to reach the fixture.
- Problem can be minimized by placing the hot water heater closer to the end use and utilizing smaller pipe diameters.

### Maintenance

- The use of smaller water emitting openings may cause ultra low-flow faucets to clog with debris or mineral deposits more often than conventional faucets.
- More frequent cleaning will help reduce any debris or mineral build-ups

### Related Technologies

**Low-flow faucets can be combined with automatic sensors.**

#### References/Useful Resources:

- [1] U.S. Department of Energy [http://www.energysavers.gov/your\\_home/water\\_heating/index.cfm/mytopic=13050](http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=13050)
- [2] EPA WaterSense. Accessed August 2010 at <http://www.epa.gov/watersense/index.html>

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[ENERGY AND ENVIRONMENT]

## Energy Savings

### Energy Efficiency

- Yields a reduction in energy to deliver and treat water. The energy required for heating hot water is reduced due to the decrease in hot water consumption

## Environmental Impacts

### Water Efficiency

- Contributes to a decrease in water usage and water cost, which in turn promotes a more sustainable environment. Using water more efficiently helps maintain reservoirs and groundwater levels.

## Guiding Principles<sup>1</sup>

### Water Use Reduction (Water Efficiency)

- Employ strategies that in aggregate use 20 percent less water than the water use baseline calculated for the building.
- Specify EPA’s WaterSense-labeled products or other water conserving products, where available.

## Associated LEED Credits (NC 2009)<sup>2</sup>

### EAc1: Optimize Energy Performance (1-19 points)

- Demonstrate a percentage improvement in energy performance compared to a baseline performance per ASHRAE/IESNA Standard 90.1-2007.

### WEc3: Water Use Reduction (2-4 points)

- Reduce total building water use by a minimum of 20 percent from baseline calculation. The baseline water use for residential and commercial faucets is 2.2 and 0.5 gallons per min (gpm), respectively.

Fixture	Water Use Baseline	Water Efficient Target	Units
Water closet	1.6	1.1 - 1.28	Gallons per flush
Commercial lavatory faucets	0.5	0.5	Gallons per minute
Residential lavatory faucets	2.2	0.5 - 1	Gallons per minute
Commercial prerinse spray valve	1.6	TBD	Gallons per minute
Residential kitchen faucet	2.2	1.5 - 2.2	Gallons per minute
Residential showerheads	2.5	1.5	Gallons per minute

<sup>1</sup> Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings [www.wbdg.org/pdfs/hpsb\\_guidance.pdf](http://www.wbdg.org/pdfs/hpsb_guidance.pdf)

<sup>2</sup> USGBC LEED Reference Guide for Green Building Design and Construction, 2009 Edition

# Ultra-Low-Flow Faucets

## [PRODUCT AND ECONOMICS]

### Product Images



(Source: American Standard<sup>3</sup>)



(Source: Sloan<sup>4</sup>)



(Source: Niagara Conservation<sup>5</sup>)

### Components

**Ultra Low-Flow Faucet, Aerator Attachment (where applicable), Automatic sensor (where applicable)**

### Cost Range

Components	Cost	Unit
Bathroom Ultra Low-Flow Faucet	\$100 – \$200	per faucet
Kitchen Ultra Low-Flow Faucet	\$300 – \$700	per faucet
Ultra Low Flow Faucet with automatic sensor	\$400-\$700	Per faucet/sensor combination
Aerator Attachment	\$5 – \$20	per attachment

### Product Types

#### Aerating Faucet

- Aerating faucets mix air into the water stream as it leaves the faucet, reducing flow while increasing efficiency.
- Distribute less water over a greater area.

#### Non-Aerating Faucet

- Non-aerating faucets add a pulse into the water stream which maintains the temperature while delivering a regular spray.

### Vendors

**American Standard** Cadet Single Control Bathroom Faucet

<http://www.americanstandard-us.com/products/productDetail.aspx?id=3052>

<sup>3</sup> <http://www.americanstandard-us.com/bathroom-faucets/reliant-3-centerset-bathroom-faucet/>

<sup>4</sup> [http://www.sloanvalve.com/Our\\_Products/Solis\\_Faucet.aspx](http://www.sloanvalve.com/Our_Products/Solis_Faucet.aspx)

<sup>5</sup> <http://www.niagaraconservation.com/Aerators.html>

**Moen** Adler Chrome Two-handle Low Arc Bathroom Faucet

[http://www.moen.com/adler/chrome-two-handle-low-arc-bathroom-faucet/\\_/R-CONSUMER%3ACA84420](http://www.moen.com/adler/chrome-two-handle-low-arc-bathroom-faucet/_/R-CONSUMER%3ACA84420)

**Delta** Classic Two Handle Centerset Lavatory Faucet

<http://www.deltafaucet.com/bath/details/2520.html>

**Sloan** SOLIS Faucets

[http://www.sloanvalve.com/Our\\_Products/Solis\\_Faucet.aspx](http://www.sloanvalve.com/Our_Products/Solis_Faucet.aspx)

**Warranty Info** Varies, 0 – 2 years depending on brand.

**Code Restrictions** None.

# Ultra-Low-Flow Faucets

## [SPECIFICATIONS]

### GENERAL<sup>6</sup>

#### FAUCETS & AERATORS

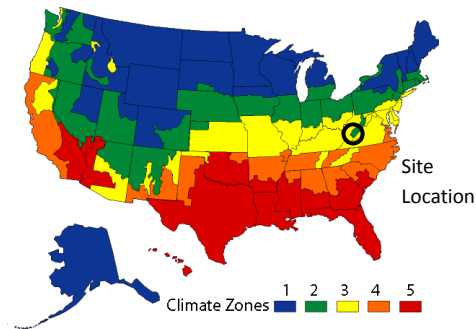
- A. Water flow and consumption rates for plumbing fixtures:
  - 1. Comply with requirements in Public Law 102-486, Energy Policy Act.
  - 2. Provide WaterSense labeled products for High-Efficiency Lavatory Faucets.
  
- B. Fixtures:
  - 1. Water management: Provide low flow fixtures and automatic, sensor operated faucets, when appropriate. Provide automatic, sensor operated faucets to comply with ASSE 1037 and UL1951.
    - a. Faucets and aerators: WaterSense labeled. Flow rate should be between 0.5 and 1.5 gal/min when measured at a flowing water pressure of 60 pounds per square inch (psi).
  
  - 2. Toxicity/IEQ:
    - a. Traps: Provide traps with removable access panels for easy clean-out at sinks
    - b. Water filter systems: Provide filters for chlorine at sinks.
    - c. Low corrosion flux for copper pipe: Comply with ASTM B813.

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<sup>6</sup> Specification language modified from the Whole Building Design Guide's *Federal Green Construction Guide for Specifiers*, Section 22 40 00 (15400) Plumbing Fixtures. Accessed August 2010 at [http://www.wbdg.org/ccb/browse\\_org.php?o=84](http://www.wbdg.org/ccb/browse_org.php?o=84) (last updated January 2010).

## Huntington Veteran Affairs Medical Center

### Huntington, West Virginia



#### Facility

- Huntington Veteran Affairs Medical Center is an acute medical and surgical care facility serving veterans in West Virginia, Ohio and Kentucky.
- Facility is comprised of 24 buildings or a total of 635,000 square feet.
- The approximately 1,000 professional, technical, and support personnel at Huntington VA Medical Center served 293,000 outpatients and 4,200 inpatients in 2008.

#### Approach

- Large retrofit of faucets and showerheads was implemented in offices, clinics, a surgery unit, patient rooms, and laboratories.
- Replaced 178 faucets that functioned at 2.5 gallons per minute (gpm) with units that functioned at 1.5 gpm.
- Replaced 33 showerheads that functioned at 2.2 gpm with models that functioned at 1.75 gpm.

#### Results

- Replaced toilets with both high-efficiency units and dual flush units.
- The retrofit effort saved over 1.5 million gallons of water annually, based on metered pre- and post- retrofit data and average occupancy rates.
- Using a combined water and sewer cost of \$10 per thousand gallons, cost savings was \$12,000 per year.  
Energy savings of 5,800 therms per year was achieved as a result of the reduced hot water consumption, or an additional cost savings of \$7,200 per year.

#### References/Useful Resources:

- [1] U.S. Department of Energy, *Huntington Veterans Affairs Medical Center—Faucet and Showerhead Replacement Project*, [http://www1.eere.energy.gov/femp/pdfs/huntingtonva\\_watercs.pdf](http://www1.eere.energy.gov/femp/pdfs/huntingtonva_watercs.pdf)