Energy Efficiency and Renewable Energy
Federal Energy Management Program

How to Buy a Water-Saving Showerhead

Why Agencies Should Buy Efficient Products

- *Executive Order 13123 and FAR section 23.704 direct agencies to purchase products in the upper 25% of energy efficiency, including all models that qualify for the EPA/DOE* ENERGY STAR® *product labeling program.*
- *Agencies that use these guidelines to buy efficient products can realize substantial operating cost savings and help prevent pollution.*
- *As the world's largest consumer, the federal government can help "pull" the entire U.S. market towards greater energy and water efficiency, while saving taxpayer dollars.*

Federal Supply Source:

- General Services Administration (GSA)
  Phone: (816) 926-6760
  www.fss.gsa.gov
  www.gsaadvantage.gov
- Defense Logistics Agency (DLA)
  Phone: (800) DLA-2852 or (215) 737-7950
  www.dla.mil
  www.emall.dla.mil

For More Information:

- DOE's Federal Energy Management Program (FEMP) Help Desk and World Wide Web site have up-to-date information on energy-efficient federal procurement, including the latest versions of these recommendations.
  Phone: (800) 363-3732
  www.eere.energy.gov/femp/procurement
- American Water Works Association's *WaterWiser* is a good resource for water conservation and efficiency information.
  Phone: (800) 926-7337
  www.waterwiser.org
- California Energy Commission (CEC) has a list of certified plumbing fixtures that can be found online at.
  www.energy.ca.gov/appliances/appliance/excel_based_files/plumbing/plumbing fittings.zip
- *Home Energy* magazine provides water conservation tips.
  Phone: (510) 524-5405
  www.homeenergy.org
- *Consumer Reports* rates plumbing fixtures.
  www.consumerreports.org
- Contact your local water utility for details about conservation programs and incentives.
- Lawrence Berkeley National Laboratory provided supporting analysis for this recommendation.
  Phone: (202) 646-7950

Efficiency Recommendation

Product Type	Recommended Flow Rate[a]	Best Available Flow Rate
Showerhead	2.2 gallons per minute or less	1.5 gallons per minute[b]

a) Based on ASME test procedure A112.18.1M-1994, with an inlet water pressure of 80 pounds per square inch.

b) Some lower-flow models exist, but shower quality is sacrificed.

Where to Find Water-Saving Showerheads

Water-saving showerheads are available through the General Services Administration (GSA) and Defense Logistics Agency (DLA). GSA sells showerheads through its Multiple Awards Schedule program and online shopping network *GSAAdvantage!* DLA offers them through the Defense Supply Center Philadelphia and online through *DoD EMall*. Purchase models that meet the recommended flow rate shown in the table above. When purchasing showerheads through a commercial source, request models that meet this Efficiency Recommendation.

Buyer Tips

There is substantial difference in the performance of showerheads, even among models with the same flow rate, due to variations in water pressure and spray patterns. The Energy Policy Act sets the maximum flow for showerheads at 2.5 gpm (gallons per minute) at 80 psi (pounds per square inch) or 2.2 gpm at 60 psi. The actual flow rate and performance will depend on local water pressure.

Mineral buildup can clog showerheads resulting in significantly less flow than what they are rated. Some showerheads can be taken apart and cleaned of this while other require replacement. In areas with hard water, consider purchasing showerheads that can easily be taken apart and cleaned.

Older showerheads that predate the current standard can use 5 to 8 gpm. Early replacement of these showerheads can lead to even greater water and energy savings than shown in the Cost-Effectiveness table below.

Early Replacement

Showerhead Cost-Effectiveness Example

Performance	Base Model[a]	Recommended Level	Best Available
Water Use Only			
Gallons per minute (gpm)	2.5 gpm	2.2 gpm	1.5 gpm
Annual Water Use	18,250 gallons	16,060 gallons	10,950 gallons
Annual Water Cost	$73	$64	$44
Lifetime Water Cost	$625	$550	$375
With Electric Water Heating			
Annual Energy Use	2,354 kWh	2,071 kWh	1,412 kWh
Annual Energy Cost	$141	$124	$85
Lifetime Energy Cost	$1,175	$1,035	$705
Lifetime Energy and Water Cost Savings	–	**$215**	**$720**
With Gas Water Heating			
Annual Energy Use	122 therms	108 therms	73 therms
Annual Energy Cost	$73	$65	$44
Lifetime Energy Cost	$585	$515	$350
Lifetime Energy and Water Cost Savings	–	**$145**	**$485**

a)The flow rate of the Base Model just meets the current federal standards for showerheads.

Definition

Lifetime Energy or Water Cost is the sum of the discounted value of annual energy or water costs, based on average usage and an assumed showerhead life of 10 years. Future energy price trends and a discount rate of 3.0% are based on federal guidelines (effective from April, 2004 to March, 2005). Future water and waste water treatment costs are conservatively assumed to increase only at the rate of inflation.

Cost-Effectiveness Assumptions

Showerhead use is assumed to be 10 minutes per shower, 2 showers per day, 365 days per year. The showerhead water temperature is assumed to be 106°F with an inlet water temperature of 58°F and pressure of 80 psi. The assumed electricity and gas prices are 6¢/kWh and 60¢/therm, the federal average energy prices in the U.S. The assumed combined water and waste-water price is $4.00 per 1,000 gallons.

Using the Cost-Effectiveness Table

In the example shown above, a new showerhead with a Recommended flow rate of 2.2 gpm will generate $215 in water and energy cost savings when water heating is electric, or $145 in savings if water is heated with gas. Similarly, a Best Available showerhead, with a flow rate of 1.5 gpm, will save $720 with electric water heating or $485 with gas water heating. Since the cost to install these showerheads is very small, their purchase is certain to be cost-effective.

Metric Conversions

1 gallon = 3.8 liters
1 therm = 100,000 Btu
= 29.3 kWh
=105.5 MJ
1 psi = 6.9 kPa
*°F = (1.8 * °C) + 32*

What if my Water or Energy Price is different?

Recalculate your Lifetime Energy or Water Cost by using your own water and energy prices, and make the corresponding adjustments in the Lifetime Energy and Water Cost Savings. For example, to adjust for a different electricity price, multiply the Lifetime Energy Cost by this ratio: $\left(\frac{Your\ price\ in\ ¢/kWh}{6.0\ ¢/kWh}\right)$. Similar adjustments can be made for different gas and water prices.

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