

Energy Efficient Homes: Laundry Area¹

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Quick Facts

- Running a hot water wash with warm rinse costs 5 to 10 times more than a cold wash and rinse.
- Front-loading washers are more efficient than most top-loading models because the tub doesn't need to be filled with as much water to do the job.
- Owning and using more efficient washers and dryers save you money not only by reducing your energy costs, but also by extending the life of your clothes.
- **WF** Water Factor; gallons of water used per cycle, per cubic foot capacity of the tub; the lower the WF, the less water the washing machine uses
- **EF** Energy Factor; the number of pounds of clothing a dryer can dry with 1 kilowatt-hour of usage
- **Intake vent** Where a dryer draws air in
- **Exhaust vent** Where hot air from the dryer exits the house during the drying cycle

Terms to Get You Started

- **MEF** Modified Energy Factor; measures the energy used during the washing process as a whole, including washing machine energy, water heating energy, and dryer energy required for the removal of the remaining moisture in the wash load; the higher the MEF, the more efficient the clothes washer.

Why should I worry about energy use in the laundry room?

The laundry room can be a big consumer of energy. ENERGY STAR® states that the typical U.S. household does about 400 loads of laundry every year, using about 13,500 gallons of water (ENERGY STAR®, n.d.-a). The laundry room also generates a large amount of unwanted heat and humidity in summer, so it makes good sense to think about location options as well as the efficiency of your appliances.

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Where *should* the laundry area be located?

If possible, try to avoid putting the washer and dryer in spaces that are heated or air-conditioned. There are a couple of reasons: 1) both the dryer and washer would make your air conditioner work harder because of the heat and moisture produced during use, and 2) dryer vents lacking dampers allow warm, humid outside air to enter the home in summer and cold air to enter in the winter even when the dryer is not in use.

If the laundry room is in conditioned space, install a closeable fresh-air intake vent to the dryer, along with a closeable dryer exhaust vent. These will effectively keep unconditioned outdoor air from coming in and keep conditioned air from going out when the dryer is off.

How can I be more energy efficient with my current washing machine?

About 90% of the energy expended for washing clothes is used to heat the water (U.S. Department of Energy, January 2008). To reduce the amount of energy used to wash and dry a load of clothes, you need to use less water at a lower temperature. Therefore, use cold water whenever possible, and only wash full loads if your machine has no adjustment for load size.

What should I look for in a new washing machine when it comes to energy efficiency?

Choose the right size

Before you start shopping, decide how big a washing machine you need to meet your household's needs. Don't forget to consider the amount of physical space you have available for the machine.

Look for the ENERGY STAR® label

Figure 1 represents the ENERGY STAR® label which can only be used on products that have been proven and identified as the most energy efficient products in their classes.



Figure 1. ENERGY STAR® certified. Credits: <http://www.energystar.gov>

ENERGY STAR® qualified clothes washers cut energy and water consumption by over 40% compared to conventional models. Depending on your local utility rates and your household's usage habits, this can save your household about \$50 per year in energy and water bills (ENERGY STAR®, n.d.-b).

Washers come in two basic designs: front-loading or re-designed top-loading designs—see http://www.energystar.gov/index.cfm?c=clotheswash.pr_front_top for descriptions. Models that have earned ENERGY STAR® are available in both designs. To search for federal tax credit information, special offers, and rebates from ENERGY STAR® partners, visit:

<http://www.dsireusa.org/library/includes/map2.cfm?CurrentPageID=1&State=FL&RE=0&EE=1>

and

http://energystar.gov/index.cfm?fuseaction=rebate.rebate_locator.

Go for high MEF and low WF

In addition to size, design, and certification, you still need to know just how much energy a clothes washer uses per cycle in order to make an informed decision. The U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy requires the industry to thoroughly test and report the energy usage of all appliances. Clothes washer energy consumption is measured in two ways.

- **MEF** (Modified Energy Factor) measures the energy used during the washing process, including washing machine energy consumption per cycle, hot water energy consumption, and

dryer energy required for the removal of the remaining moisture in the wash load—the higher the MEF, the more energy efficient the clothes washer. At the time of this writing, ENERGY STAR® qualified models manufactured after January 2007 must meet the current minimum MEF standard of 1.72.

- **WF** (Water Factor) measures the gallons of water used per cycle per cubic foot (for example, a 3.0 cubic foot washer using 27 gallons per cycle has a water factor of 9.0). The lower the WF, the less water the machine uses. Currently, the maximum WF is 8.0 for ENERGY STAR® qualified models manufactured after January 2007. By July 2009, ENERGY STAR® qualified washing machines will be at least 43% more efficient than the current federal energy efficiency standards and have a maximum WF of 7.5. By January 1, 2011, ENERGY STAR® qualified washing machines will be 59% more efficient than mandated energy standards and will have a maximum WF of 6.0 (U.S. Department of Energy, March 2008).

See the ENERGY STAR® Web site

http://energystar.gov/index.cfm?fuseaction=clotheswash.display_products_html for a listing of ENERGY STAR® qualified clothes washers and more details on Modified Energy Factors and Water Factors, along with other information that is useful in sorting out your options.

Check the EnergyGuide label

The yellow *EnergyGuide* labels that appear on all new washing machines include information on the energy usage of the product, energy usage comparisons with similar models, and estimated annual operating costs. The *EnergyGuide* label was updated in 2007 to feature estimated annual operating costs more prominently (Federal Trade Commission, August 2007). See Figure 2 for an example of the new *EnergyGuide* label. When comparing *EnergyGuide* labels, be sure to look at the tub capacity printed on the label. Choose a washer with the tub capacity that meets your needs—standard sizes for residential use typically range anywhere from 2-3.5 cubic feet.

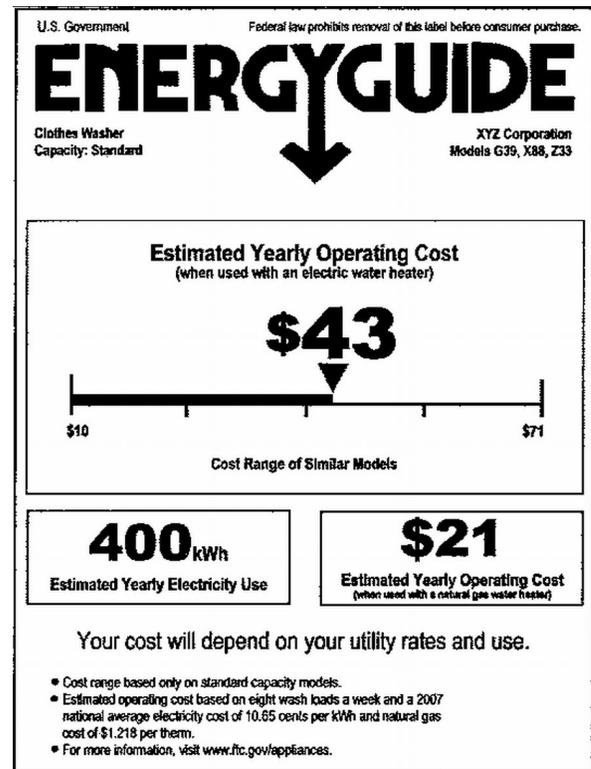


Figure 2. Sample *EnergyGuide* label Credits: Federal Trade Commission

More energy-saving options

Consider the features of the appliance as well. The American Council for an Energy-Efficient Economy and the Consumer Energy Center at the California Energy Commission both advise consumers to choose a washing machine that allows user indicated water levels, wash type selections, rinse selections, and water temperatures. They also suggest that you choose a washer with a faster spin speed so that more moisture is drawn out of a wash load before it hits the dryer. (ACEEE, 2008; CEC 2008)

What about dryers?

The Consumer Energy Center at the California Energy Commission indicates that a clothes dryer costs about \$85 a year to operate and typically uses more energy than any other home appliance except the refrigerator. (CEC 2008) There are electric dryers and gas-fired dryers. New gas-fired models are required to use an electronic ignition system, which is more efficient than a pilot light.

Note that there are no *EnergyGuide* labels or ENERGY STAR® ratings for clothes dryers because most dryers use similar amounts of energy according to their type. Instead, clothes dryers are rated by Energy Factor (EF). An EF rating measures the number of pounds of clothing the dryer can dry with 1 kilowatt-hour of electricity usage. The higher the EF, the more energy-efficient the clothes dryer is. The federal minimum EF for a standard-capacity electric dryer is 3.01. For gas dryers, the federal minimum EF is 2.67. (CEC 2008) [The rating for gas dryers is also provided in kilowatt-hours, a measure of electricity usage, even though the primary source of fuel for these dryers is natural gas which is more commonly measured in therms.]

Manufacturers have developed optional features in their efforts to make clothes dryers more energy efficient. You can now look for models that have a moisture sensor *and* automatic shutoff feature. This helps prevent over-drying, which not only wastes energy, but is hard on clothes. The best of these models have moisture sensors inside the drum. Lower-priced models have thermostats that "infer" dryness by measuring the temperature of the exhaust air. Either way, "smart" dryers are a much better deal for you than the older, timer-only machines. Compared to the older dryers, you can save 10% with a temperature-sensing control, and 15% with a moisture-sensing control

The exhaust system of the dryer also merits attention. Try to have as short and straight a duct run as possible to the outside, and make sure the duct is made of smooth metal. See Part V, Chapter 15, Section M1501 of the *2004 Florida Building Code, Residential*® (http://ecodes.iccsafe.org/icce/gateway.dll?f=templates&fn=default.htm&vid=icc:florida_residential), Section 504 of the *2007 Florida Mechanical Code*®, and Section M1502 of the *2007 Florida Residential Code*® (http://www2.iccsafe.org/states/Florida2007FinalDraft/residential/Residential07_Frameset.htm) for more information on clothes dryer exhaust requirements, including size and length limitations of ducts. Flexible vinyl duct should be avoided because it restricts airflow, can be crushed, and may not stand up to the high

temperatures of the dryer. Remember, dryer vents should also be equipped with a backdraft damper to prevent uncontrolled entry of outside air into the home.

Summary

Because the laundry area accounts for such a large percentage of any household's energy usage and resulting utility expense, it makes sense to weigh all of your options in the areas layout, your selection of appliances, and the necessary accessories that can enhance optimum performance. Remember, too, that maintenance of your appliances will not only extend their lives, but also your dollars.

For more information on energy efficiency of appliances in general, refer to another portion of this *Energy Efficient Homes* series: *Energy Efficient Homes: Appliances in General*.

References

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Other Resources

University of Florida *Energy Efficient Building Construction in Florida*, SP 267, Gainesville, FL.