# Purchasing a Water Heater

Water heaters are easy to ignore — until they stop working. The average one lasts about 8 to 12 years and accounts for roughly 15 to 20 percent of your utility bill. So if your heater is getting along in years, or if you're adding or upgrading a bathroom, remember the three cardinal rules of shopping for a standard storage water heater: Don't rush. Size matters. Energy efficiency matters more.

Admittedly, an ice-cold shower or a leaking heater makes it more urgent to get a new heater hooked up quickly. But if you choose one based solely on speed of delivery, you may end up with a unit that can't keep up with demand, costs more to operate, and fails sooner than it should.

Get Wise About Size

Even if you were happy with the old tank, don't automatically assume that it had the right heating capacity. To determine that capacity, you first need to add up about how much hot water your household uses during the busiest hour of an average day "Size a water heater for your demand 363 days a year, not the one or two days that you've got 25 relatives visiting," says Richard Trethewey, This Old House plumbing and heating expert. "Otherwise, you'll end up with an energy-gobbling beast in the basement."

This sum — your household's "peak-hour demand" for hot water — should be close to your water heater's "first-hour rating" (FHR) printed on each heater's yellow Energy Guide label. Basically, the FHR tells you how many gallons of hot water a heater can produce during an hour of high usage. (It is not the same as the number of gallons a tank can hold.)

When comparing the different types of heaters, you'll see that gas- and oil-fired units generally have higher FHRs, relative to their tank size, than do electric models. (Flames heat water more quickly than heating elements do.) If you come up with a high FHR on your worksheet, say 100 gallons or so, you may need to install a second water heater.

ELECTRIC HEATER  
Electric water heaters are lightweight, quiet, and boast the highest efficiency of any storage water heater. But the price of electricity is so high in most places that relatively inefficient fuel-fired heaters cost less to operate.

Assess Efficiency

The next number to look at is the energy factor (EF), a number that represents the percentage of energy that is turned into hot water by that specific model. The higher the number, the more efficient the unit and the less it will cost to operate. (An EF of 1 would indicate that 100 percent of the energy a heater uses is converted into hot water — a physical impossibility, alas.) While a high EF is good, you have to factor in the cost of the energy the heater uses to get a true picture of how much it costs to operate. In most areas, for example, an electric heater with an EF of 0.8 will cost more to run than a similar-size gas model with an EF of 0.6, due to the higher price of electricity compared with gas.

In most cases, water heaters with high EFs cost more to buy, but don't overlook the potential long-term savings in fuel costs. Here's an easy formula to calculate the payback period when comparing heaters that have the same FHR rating but different prices: Divide the difference between the prices of the two models by the difference between their estimated annual operating costs (printed on the Energy Guide labels). The result is the number of years it will take the energy savings to offset the higher purchase price. Look for a payback within 10 years, the expected life span of an average heater. Of course, if energy prices go up during that time, the payback period will be shorter.

Keep in mind that the estimated annual operating cost is just an approximation.

GAS HEATER  
In tightly sealed homes, look for gas-fired water heaters with sealed combustion chambers and direct or power venting. These features ensure that all exhaust fumes are pumped outside the house.

Performance Features

After determining a heater's size and efficiency rating, consider these other important factors that increase longevity and reduce operating costs.

Tank material:The typical tank is steel lined with "glass" (actually porcelain enamel). It contains anodes — magnesium or aluminum rods — suspended in the tank to fight internal corrosion, the number-one reason water heaters fail early. Stainless steel tanks don't rust (and therefore don't need anodes), but they're more expensive than glass-lined tanks. Their higher cost may be worth it in areas where the water is highly corrosive (acidic) or reactive (full of minerals that encrust the tank walls, slowing heat transfer).

Insulation: Whether foam or fiberglass, the insulation surrounding a gas- or oil-fired tank should be R-16 or higher, and R-22 or more for electric. Insulation reduces standby losses — heat that escapes while the unit is idle. Wrapping your tank in a fiberglass blanket won't make up for insufficient insulation built into the tank.

Heat traps:These built-in devices — either valves or flexible connectors bent into an inverted U — put a stop to "thermosyphoning," the tendency for hot water to rise up the supply pipe. If your water heater doesn't have one built in, a heat trap can be added during installation (or retrofitted to existing heaters).

Making Your Selection

Factor in warranties and the manufacturer's reputation before making your purchase. There's no single source to turn to for this information; talking to a few reputable plumbers and plumbing-supply stores should help you narrow the choices. Also, you may be able to take advantage of rebates or incentives offered by local utilities and municipalities to encourage the purchase of energy-efficient models. Finally, make sure the heater you've chosen will fit in the available space and still leave enough room for servicing.

Once you're ready to buy, your plumber should be able to order the model you want. Or, you may be able to buy directly from a local home center. In either case, professional installation will take about one to three hours; be sure it includes the cost to remove and dispose of the old heater.

OIL HEATER  
Oil-fired heaters heat water faster than either electric or gas units. They tend to be heavier than other heaters due to the thick lining in the combustion chamber that protects the tank from the burner's intense heat.

Maintenance

A water heater can last 30 years, but most fail in about 10, due largely to neglect. Perform the following tasks annually, or hire a plumber or HVAC professional to do them, and you'll save your heater from a premature death.

Drain tank until the water runs clear (see photo). If there's lots of sediment, drain tank twice a year.

Inspect the pressure-relief valve for corrosion. If rusty, have a plumber replace it right away.

On a gas or oil-fired unit, check combustion chamber and flue vent for rust, corrosion, and obstructions. On an electric heater, remove and check heating elements, but first shut off power and drain tank.

Remove and inspect anode rod (or rods). Replace if 6 inches or more of the rod's core wire is exposed.

Keep water temperature between 120 and 130 degrees. (Check with a thermometer under the tap.) Higher temperatures speed corrosion.

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