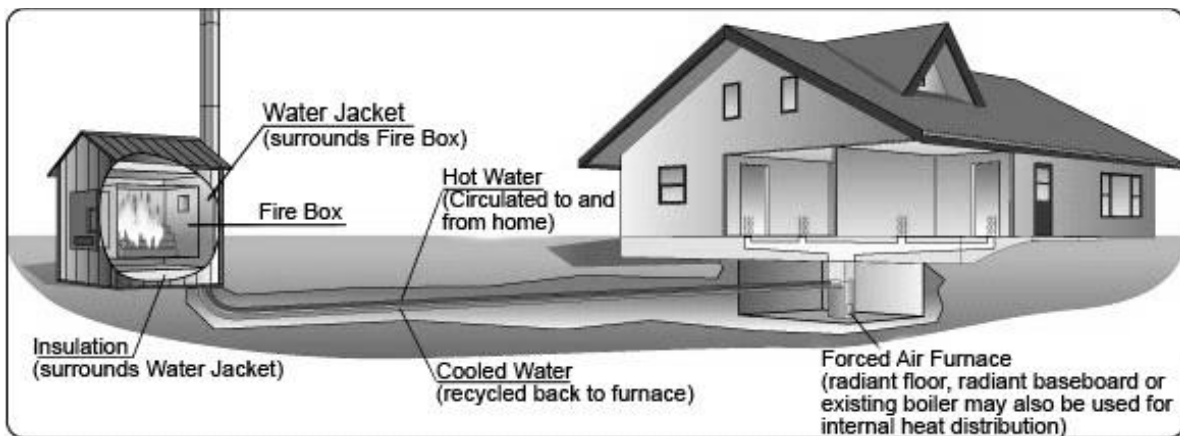


## Outdoor Wood-Fired Boilers

### What is an outdoor wood-fired boiler?

Outdoor wood-fired boilers (OWBs), also known as outdoor hydronic heaters, are free-standing wood-burning devices that heat liquid (water or water-antifreeze) that is then pumped underground to provide heat and hot water to one or more structures. They are typically the size and shape of a small storage shed or mini-barn with a short smoke stack on top. OWBs may be used to heat homes, greenhouses and other buildings, produce domestic hot water, heat swimming pools or hot tubs, and provide heat to agricultural operations such as dairies.



Source: Hearth, Patio and Barbeque Association (from United States Environmental Protection Agency website).

### How do OWBs differ from other wood-burning appliances?

OWBs are much larger and differ in design, operation and emissions produced from the smaller indoor wood stoves, pellet stoves, fireplaces and barbeque pits. Following are some concerns that are unique to the operation of OWBs:

- **Smoke** - Older model OWBs often employ a very primitive combustion technology that allows the unit to operate in "idle" mode for long periods of time. This type of operation causes very poor combustion and continuous, heavy smoke.
- **Short Stack Height** - OWBs are typically equipped with a very short smoke stack. The short stacks and reduced draft of OWBs fail to disperse emissions adequately and can cause smoky conditions at or near ground level.
- **Year-Round Operation** - OWBs are used to heat houses, shops, domestic hot water, swimming pools, greenhouses and spas. This means that smoke may be emitted year round, even in the summer when owners and neighbors want to enjoy the outdoors.
- **Fuel Choices** - Because OWBs are designed with a large firebox and are located outdoors, some owners use them to burn household garbage, tires and other wastes, including hazardous waste. Burning these other substances in an OWB produces additional toxic and hazardous air pollutants.

### What are the air quality concerns associated with OWBs?

Smoke caused by operating some OWBs can have serious health and air pollution impacts in addition to being a nuisance to neighbors. The smoke from OWBs can contain emissions of fine particulates, carbon monoxide and other organic products, such as formaldehyde, benzene and aromatic hydrocarbons, that form from incomplete combustion. When inhaled, fine particulates from smoke emissions are carried deep into the lungs and can impair lung function and aggravate existing medical conditions such as asthma, lung or heart disease. Exposure to some pollutants in smoke can even cause cancer.

### What is the EPA voluntary OWB program?

Unlike *indoor* wood stoves that are regulated by the United States Environmental Protection Agency (EPA), OWBs are not required to meet a federal emission standard. Instead, EPA initiated a voluntary partnership program with manufacturers to design and market cleaner-burning, more efficient OWBs. Through this voluntary effort, OWBs are certified and labeled to meet EPA emissions performance standards in two phases. OWBs qualifying for the Phase 1 emission standard of 0.60 pounds of particulate matter (PM) per million British thermal

units (BTUs) of heat input are labeled with an orange tag. OWBs qualifying for the Phase 2 emission standard of 0.32 pounds of PM per million BTU of heat output are labeled with a white tag. Additional information about the EPA voluntary OWB program is available on EPA's website at [www.epa.gov/woodheaters/index.htm](http://www.epa.gov/woodheaters/index.htm).

### How does Pennsylvania DEP regulate OWBs?

The final-form OWB regulation, codified in 25 Pa. Code Section 123.14, was published in the *Pennsylvania Bulletin* on Oct. 2, 2010 (40 Pa. B. 5571). Key provisions of the OWB final rulemaking are summarized below:

- Section 123.14(b)(3) provides that a person may not sell, offer for sale, distribute or lease a non-Phase 2 OWB unless it was manufactured, distributed, purchased or leased and received in this commonwealth before May 31, 2011. A non-Phase 2 OWB installed during the sell-through period of Oct. 2, 2010, and May 31, 2011, shall meet the following requirements: the non-Phase 2 OWB shall be installed a minimum of 150 feet from the nearest property line; and it shall have a permanently attached stack that extends a minimum of 10 feet above the ground.
- Section 123.14(c) specifies that except as provided under subsection (b), a person may not sell, offer for sale, distribute or install an OWB unless it is a Phase 2 OWB.
- Section 123.14(d) establishes setback requirements which prohibit a person from installing, using or operating a new Phase 2 OWB unless the boiler is installed a minimum of 50 feet from the nearest property line.
- Section 123.14(e) establishes stack height requirements for new Phase 2 OWBs. A person may not install, use or operate a new Phase 2 OWB in this state unless the boiler has a permanently attached stack. The stack must meet both of the following requirements: extend a minimum of 10 feet above the ground; and be installed according to the manufacturer's specifications.
- Section 123.14(f) specifies that a person that owns, leases, uses or operates an OWB in this state shall use only one or more of the following fuels: clean wood; wood pellets made from clean wood; certain home heating oil, natural gas or propane fuels; or other fuel approved in writing by the department.
- Section 123.14(h) specifies that OWBs must be used or operated in accordance with applicable commonwealth, county and local laws and regulations. The following laws and regulations are among those that could apply:
  - 25 Pa. Code Section 121.7 - Prohibition of Air Pollution
  - 25 Pa. Code Section 123.1 - Fugitive Emissions
  - 25 Pa. Code Section 123.31 - Odor Emissions
  - 25 Pa. Code Section 123.41 - Visible Emissions
  - Section 8 of the APCA, 35 P.S. Section 4009 - Unlawful Conduct
  - Section 13 of the APCA, 35 P.S. Section 4013 - Public Nuisances

### What are some best burning practices for OWBs?

- Inspect the home or consult with an energy expert. Homeowners may find that more insulation or other energy-saving improvements may be a better investment than an expensive wood heating device.
- Consider the neighbors. Burning wood in some areas may never be a good idea.
- Know the regulations before purchasing an OWB. Pennsylvania and many municipalities have enacted laws or ordinances that regulate OWBs.
- If a homeowner decides to purchase an OWB, buy the most efficient OWB possible and have it installed by a professional.
- Have the OWB chimney and vents professionally inspected and cleaned at least once a year.
- Burn only dry, well-seasoned clean wood that has been split properly or wood pellets made from clean wood.
- Store wood outdoors, stacking it neatly off the ground with the top covered.
- Operate according to manufacturer's instructions.
- Build hot fires. A smoldering fire is not an efficient or safe fire.
- Keep the doors of the OWB closed unless loading or stoking the live fire. Regularly remove ashes.
- Do not operate the OWB between the dates of May 1 and Sept. 30 when neighbors are more likely to be spending time outdoors.
- Never start a fire with gasoline, kerosene, charcoal starter or a propane torch.
- Never burn any garbage, cardboard, plastics, magazines, tires, furniture, animal carcasses or manure, driftwood, construction wastes, yard wastes, plywood, particle board, or coated, painted, or pressure-treated wood, etc., because they produce harmful chemicals when burned.
- Never burn wet, rotted, diseased or moldy wood.

### Where can consumers get more information about OWBs?

For more information, visit [www.dep.state.pa.us](http://www.dep.state.pa.us), keyword: Open Burning. Consumers may also call DEP's Bureau of Air Quality at 717-787-9702.