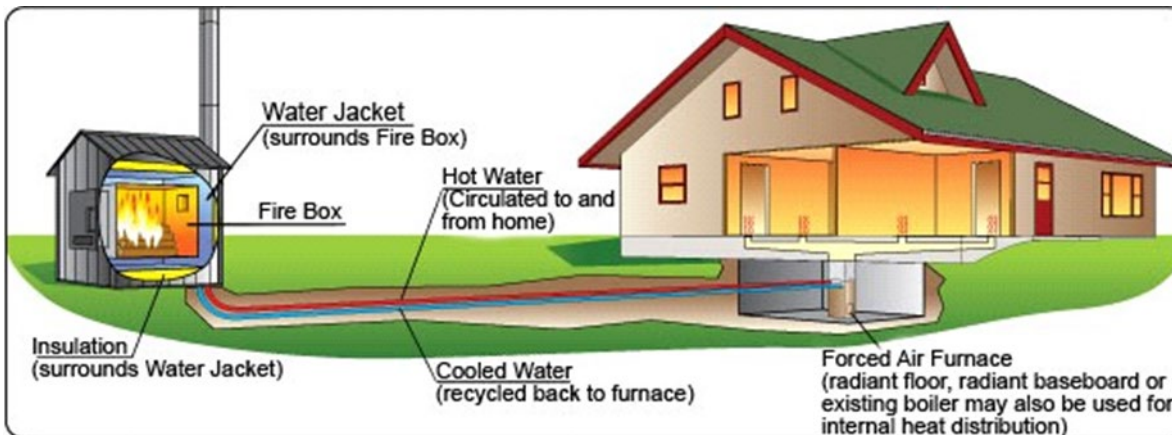


Outdoor Wood-Fired Boilers

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 smokestack 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 US 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 smokestack. 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 and is **illegal**. Burn only clean, dry wood and other allowed fuels.

What are the air quality concerns associated with OWBs?

Smoke from OWBs can have serious health and air pollution impacts, in addition to being a nuisance to neighbors. Smoke from residential wood heaters contains fine particle pollution, also known as fine particulate matter or PM_{2.5}, along with other pollutants including carbon monoxide, volatile organic compounds (VOCs), black carbon, and air toxics, such as benzene. Residential wood smoke can increase particle pollution to levels that pose serious health concerns, and in some areas constitutes a significant portion of the fine particle pollution problem.

The fine particles in smoke - also called fine particle pollution or PM_{2.5} - can get deep into the lungs, harming the lungs, blood vessels, and heart. People with heart, vascular, or lung disease, older adults, and children are the most at risk.

What requirements apply to OWBs in Pennsylvania?

Federal Requirements: All OWBs must comply with the Federal regulations found at 40 CFR Part 60, Subpart QQQQ-[Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces](#) (NSPS). OWBs manufactured, imported, or sold between May 15, 2015, and May 15, 2020, must meet the Step 1 (equivalent to Pennsylvania's "Phase 2") emission rate of 0.32 pounds per million Btu heat output. Effective May 15, 2020, OWBs are required to meet the Step 2 emission rate of 0.10 pounds per million Btu heat output. Visit [EPA's Wood Stove Database](#) to view the list of EPA-certified Step 2 OWBs.

Additional Pennsylvania Requirements: In addition to being EPA-certified as meeting the NSPS Step 1 or 2 emission rate, depending on the date of the OWB, Pennsylvania's OWB regulation, 25 Pa. Code Section 123.14, requires:

- **Setback** - must be installed a minimum of 50 feet from the nearest property line
- **Minimum Stack Height** - must have a permanently attached stack installed according to the manufacturer's specifications that extends a minimum of 10 feet above the ground.
- **Fuel** - may only burn clean wood, wood pellets made from clean wood, home heating oil, natural gas or propane fuels, or other fuel approved in writing by DEP.
- **Other Rules** - OWBs must be operated in accordance with applicable Commonwealth, county, and local laws and regulations.
- **Check with your municipality!** Many have additional local restrictions or prohibit OWBs.

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 or prohibit OWBs.
- If you decide to purchase an OWB, buy the most efficient OWB possible and have it installed by a professional, and verify it is an EPA-certified unit.
- 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 September 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?

Visit EPA's [Burn Wise](#) website to learn more.

For more information, visit www.dep.pa.gov.