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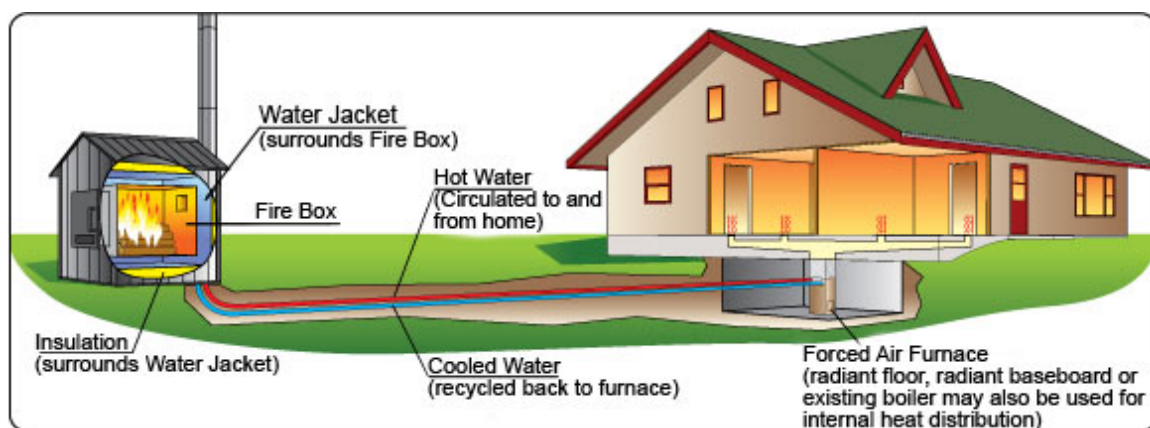
2009

Outdoor Wood-Fired Boilers and Air Quality *Considerations and Best Management Practices*

Background on Outdoor Wood-Fired Boilers

Outdoor wood-fired boilers (OWBs), also known as outdoor wood-fired hydronic heaters, are free-standing wood-burning devices that heat water, which is then pumped to one or more structures to provide heat. They resemble a small shed with a smokestack on top. OWBs may be used to heat homes and buildings, produce domestic hot water, heat swimming pools or hot tubs, and provide heat to agricultural operations such as greenhouses and dairies.

Many OWBs are used in rural, cold climates like New Hampshire's, where wood is readily available. Wood is a renewable resource and a valuable fuel source because it is "global warming neutral" when harvested in a sustainable manner. With rising fossil-fuel prices, these wood-burning devices can offer a viable alternative heat source, if the cleanest OWBs are purchased and they are installed and operated properly.



Source: Hearth, Patio and Barbeque Association (from US EPA website)

Air Quality Concerns Associated with OWBs

A concern associated with certain OWBs is the air pollution they may produce. Smoldering fires and short smokestacks may create heavy smoke close to the ground that sometimes causes a neighborhood nuisance or an adverse impact on public health and the environment.

Smoke from OWBs can contain emissions of fine particle pollution, carbon monoxide, and other organic products, such as formaldehyde, benzene and aromatic hydrocarbons, which form from incomplete combustion. When inhaled, fine particles 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.

Fortunately, recent advances in OWB technology have resulted in cleaner-burning units. The use of these cleaner-burning units, in conjunction with best management practices, can reduce and minimize any adverse health and environmental impacts associated with using these devices.

Regulating Outdoor Wood Boilers – Federal Voluntary Program



While indoor wood stoves must meet EPA certified emissions levels, OWBs are not required to meet a federal emission standard. Instead, in 2007 EPA initiated a voluntary partnership with manufacturers to design and market cleaner, more efficient OWBs. Through this voluntary effort, OWBs are certified and labeled to meet EPA emissions performance levels in two phases: Phase I emissions levels of 0.60 pounds of particulate matter per million British thermal units (Btus) of heat input; and Phase II emissions levels of 0.32 lbs. of particle pollution per million Btus of heat output.

EPA's voluntary program uses an orange or white tag labeling program that identifies cleaner units and shows how they compare to EPA's Phase I and Phase II emissions levels. EPA also asks participating manufacturers to provide information in the owners manual regarding proper operation and maintenance of the units, including what is allowed to be burned.

Regulating Outdoor Wood-Fired Boilers – New Hampshire State Law

New Hampshire amended its laws in 2008, establishing requirements for the sale, installation, and use of OWBs in the state. In passing the amendments, New Hampshire joins other New England state and local governments in recognizing the potential high levels of particle pollution and adverse health effects associated with OWBs. The law also acts to establish emission standards and prohibit the sale of any units that do not meet those standards.

Components of the law include, but are not limited to:

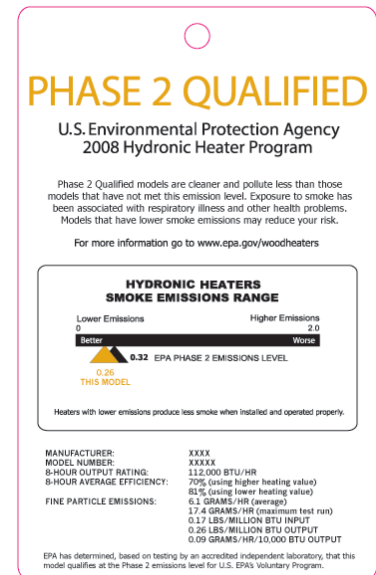
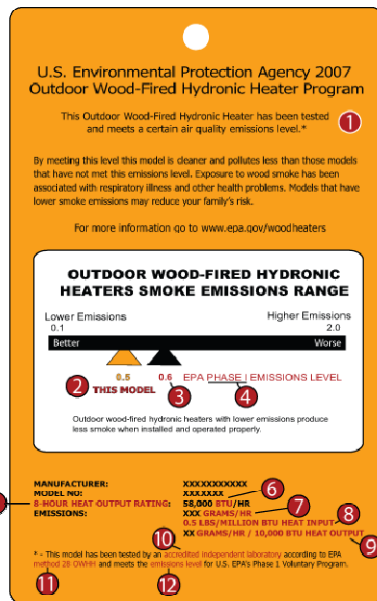
- **Sales requirements:** Effective January 1, 2009, all OWBs sold in New Hampshire must meet the EPA Phase I emission limits. Effective April 1, 2010, all OWBs that are sold in the state must meet the Phase II emission limits.
- **Selling and Buying responsibilities:** Any seller of an OWB is required to provide written notice to a prospective buyer on New Hampshire's law. The written notice must be signed and dated by the buyer and seller, include specific information on the OWB purchased, and be kept on file by the seller for at least three years.

- **Setback and stack height requirements for installation of OWBs:**
 - Phase I units: Must be 100 feet from nearest property line; stack height must be two feet higher than the peak of a roof of a residence or business not served by the unit, which is located within 300 feet.
 - Phase II units: Must be 50 feet from the nearest property line; no stack height requirements.
 - Non-Phase I or II units: Must be 200 feet from nearest abutting residence; stack height must be two feet higher than the peak of a residence or business not served by the unit, which is located within 300 feet.
- **Permitted fuels:** Clean wood and/or wood pellets made from clean wood are the only fuels that can be burned in these devices.
- **Prohibited fuels:** Burning other materials such as household trash, tires or construction debris is strictly prohibited.

Tips to Reduce Air Pollution from Outdoor Wood-Fired Boilers

If you plan to purchase an OWB, look for the cleanest models available that are labeled with the EPA voluntary program orange (Phase I) or white (Phase II) hang tags (see sample labels). Consider all alternatives and choose a heating system that is the most efficient and has the least adverse impacts to your family and neighbors.

If you already own an OWB, you should install, operate, and maintain it according to state law and the manufacturer's instructions.



A few recommended best management practices for all OWBs include:

- Have the unit installed by a professional.
- When determining where to locate the OWB, take into consideration how close it is to neighboring properties, especially residences. Become familiar with setback requirements from property lines or structures as specified by New Hampshire law or local ordinances, and be aware of the direction of prevailing winds and the contours of the land.
- Become familiar with manufacturers recommendations for installation and best management practices for operation, and be sure to comply with stack heights as specified by New Hampshire law.

- Never start a fire with gasoline, kerosene, charcoal starter, or a propane torch, unless the unit is designed with an auxiliary starting unit for this purpose.
- Burn only dry, well-seasoned wood that meets the definition of “clean” wood. Never burn wet, rotted, diseased or moldy wood.
- **NEVER** burn household garbage, cardboard or coated, painted, or pressure-treated wood – it’s against the law!
- Keep the doors of the unit closed unless you are loading or stoking the live fire.
- Regularly remove ashes from the OWB into a metal container with a cover and properly cool before disposing.
- Conduct yearly maintenance. EPA and fire officials recommend that your OWB, chimney, and vents be professionally inspected and cleaned each year to keep them in safe working order.

For More Information

For general information about OWBs in New Hampshire and state law requirements, contact the DES Air Resources Division at (603) 271-1370.

Other Resources

For complete text of New Hampshire’s law regulating OWBs (HB 1405, Chapter 362, Laws of 2008): www.gencourt.state.nh.us/legislation/2008/HB1405.html

EPA website for information about OWBs and EPA’s voluntary program:
www.epa.gov/woodheaters

EPA list of certified cleaner-burning OWBs: www.epa.gov/woodheaters/models.htm

Introducing EPA Phase 2 Qualified Hydronic Heaters (poster):
www.epa.gov/woodheaters/pdfs/poster.pdf

Understanding the EPA “Orange Tag” label (Phase I): www.epa.gov/woodheaters/guide.htm

Understanding the EPA “White Tag” label (Phase II):
<http://www.epa.gov/woodheaters/guidewhite.htm>