

Kerosene Space Heaters

The increased availability of unvented portable kerosene heaters raises many questions regarding their safe and efficient use for heating homes, shops, campers, and other structures.

Presently, Oregon law prohibits the use of portable unvented fuel-burning heaters in residential buildings (Uniform Mechanical Code, sec. 808[C]).

Fire is one potential hazard of using kerosene heaters. Many of the newer models have safety features and are tested by Underwriters Laboratories (UL) for safety. Select only a UL-approved heater and carefully follow recommended safety procedures.

Another concern is the effect of kerosene heaters on the air quality in the structure. Kerosene heaters produce four noxious gases as combustion byproducts—carbon monoxide, carbon dioxide, nitrogen dioxide, and sulfur dioxide. These gases are especially hazardous to infants, pregnant women, elderly, asthmatics, and those with cardiovascular diseases. The hazards from indoor pollution are highest on calm days.

Many structures that might use unvented heaters are modified or built to very tight standards for energy conservation. Consequently, there is minimal air passage through cracks around windows and doors to remove the noxious gases. Be sure to match the size of heater to the size of the nonresident room or structure where it will be used. Be sure to provide at least 4 square inches of outside ventilation area for each 1,000 Btu-per-hour of heater capacity. For a 10,000-Btu heater rating, most manufacturers suggest 40 square inches of opening to the outside. This is about a 1½ inch opening for a 30-inch-wide window.

To help reduce the production of sulfur dioxide, use only grade 1-K kerosene. It is low in sulfur, with a maximum content of 0.04 weight percent, which compares to 3.0 weight percent in grade 2-K or regular-grade kerosene. Contrary to some claims, grade 1-K kerosene cannot be identified positively by its color or clarity, although it is normally colorless.

To determine if a portable unvented kerosene heater is an economical source of heat, use the table to compare 1-K kerosene fuel with electricity as a heat source. The table lists the kerosene heating value (135,085 Btu/gal) and electricity heating value (3,413 Btu/kWh).

Comparative costs for heating (kerosene versus electric portable space heaters)

Cost of electricity ¹ (cents/kWh)	Cost of kerosene ² (dollars/gal)	
	95	90
3	1.13	1.07
4	1.50	1.43
5	1.88	1.78
6	2.26	2.14
7	2.63	2.50
8	3.00	2.85

¹Electricity heat content 3,413 Btu/kWh. Electric heater efficiency at 100 percent.

²Kerosene heat content 135,085 Btu/gal. Kerosene heater efficiency listed at 95 and 90 percent.

The kerosene heaters are listed with both 90 and 95 percent efficiency, while the electric heater is rated at 100 percent efficiency. The October 1982 *Consumer Reports* magazine rates today's portable kerosene heaters as about 90 percent efficient. Some manufacturers, however, claim 92 percent efficiency for their heaters.

Compare the cost of electricity in your area to the cost of 1-K kerosene to determine your savings. For example, electricity at a 7-cent-per-kilowatt-hour rate is equivalent to kerosene at \$2.50 per gallon when used in a 90 percent efficient heater and \$2.63 per gallon when used in a 95 percent efficient heater. The cost of heat from 4-cent-per-kilowatt-hour electricity is the same per unit of heat as \$1.50 per gallon 1-K grade kerosene burned in a 95 percent efficient kerosene heater.

The initial investment in a portable kerosene heater will vary from approximately \$100 for a small unit (6,000 Btu/h capacity), to more than \$300 for a larger, deluxe unit (above 18,000 Btu/h capacity). Be sure to include the initial investment plus maintenance costs for each type of heater when comparing overall costs for heating.

In summary, when using portable kerosene heaters, follow these precautions:

- Use only UL-approved heaters;
- Equip room or structure to be heated with a smoke detector;
- Limit heater use to only supplemental heating and attend it when in use;
- Provide recommended ventilation;

- Locate heater at least 3 feet from combustibles such as furnishings, draperies, newspapers, and clothing (heaters above 10,000 Btu/h capacity need 4 feet of clearance);

- Locate heater away from traffic areas;
- Protect children and pets from coming in contact with heater;

- Avoid use of flammable sprays or liquids such as hair sprays, deodorants, paints, and finish remover near heater;

- Use only 1-K grade kerosene;
- Store kerosene for only one heating season;

- Store kerosene out of house in safe area;

- Label kerosene containers;
- Put kerosene in can specifically for kerosene; never put kerosene in a gasoline can—you might mix up cans and refill heater with gasoline;

- Allow heater to cool before refilling; always refill outdoors;

- Check heater periodically for fuel leaks;

- Clean and maintain heater according to manufacturer's instructions.



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Extension Service, Oregon State University, Corvallis, O. E. Smith, acting director. This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U. S. Department of Agriculture, and Oregon counties.

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