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Unvented Kerosene Space Heaters

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An "unvented" kerosene heater is one that lacks an attached and sealed exhaust system to remove fumes and unburned gases (byproducts of kerosene combustion) from the space being heated. If unvented, these fumes and gases can build up and endanger the room's occupants. A "vented" kerosene heater is one that has an attached and sealed exhaust system to remove these dangerous fumes and gases to the outside of the space being heated.

Oregon law prohibits the use of portable unvented fuel burning heaters in residential buildings—and for good reason.

One potential hazard of using an unvented kerosene heater is fire. Although many of the newer models have safety features (such as automatic cut-off switches to extinguish the flame if the unit is tipped over) and include recommended clearances from combustible materials, accidents still happen. Most models are tested for operating safety by Underwriters Laboratories (UL), but there is no way to guarantee safe operation.

If you must use an unvented kerosene heater, use it only in a non-residential setting such as a garage, workshop, or tool shed. Keep it in a place where no one can bump into it, and far enough away from anything combustible to eliminate a fire hazard. Select only a UL-approved heater and follow the recommended safety procedures to the letter.

Another major concern is the potentially harmful combustion byproducts given off by unvented kerosene heaters. These byproducts are carbon monoxide (CO), carbon dioxide (CO₂), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂)—gases that can be especially harmful to infants, pregnant

women, the elderly, asthmatics, and people with cardiovascular diseases.

In 1982 and again in 1985, Consumer Reports tested what it considered to be the best unvented kerosene heaters on the market. They conducted the tests in a chamber simulating the air-change rate of a moderately insulated house—about one complete air change per hour. The tests showed that, even using the best grade kerosene available (1-K), the heaters gave off combustion byproducts exceeding the maximum acceptable levels for all the above-mentioned pollutants.

The safest option is to never use an unvented kerosene heater in a residential building or living space. This is particularly true for highly weatherized or tightly built, energy-conserving homes. Some kerosene heater manufacturers recommend that users keep doors to adjacent rooms open so the pollutants aren't confined to one space, but this only distributes the pollutants into another living space.

Another recommendation is to provide at least 4 square inches of outside ventilation area for each 1,000 Btu per hour of heating capacity. For example, a 10,000 Btu-per-hour unit would require 40 square inches of ventilation to the outside, or the space provided by opening a 30-inch-wide window 1½ inches. However, this results in heat loss, and on calm days there may be insufficient air movement to remove all the combustion byproducts from the room. If convection from the heated air isn't enough to remove the pollutants, you may have to add a fan to insure adequate air movement.

As economical and practical an unvented kerosene heater may seem, it's important to consider the conclusion of the 1985 Consumer Reports article:

"We have yet to see a kerosene heater that burns cleanly enough to ease our concern about indoor air pollution resulting from the use of these devices."

Follow these recommendations when using an unvented kerosene space heater:

- Use only in a non-residential setting
- Use only a UL-approved heater
- Make sure the room or structure has a smoke detector
- Provide adequate ventilation
- Keep heater at least 3 feet from combustibles
- Keep heater out of traffic areas
- Keep children and pets away from heater
- Don't use flammable sprays or liquids near the heater
- Use only 1-K grade kerosene
- Allow heater to cool before refilling
- Always refill heater outdoors
- Check heater periodically for fuel leaks
- Maintain heater according to manufacturer's instructions
- Store enough kerosene for only one heating season
- Store kerosene outside and away from the house
- Clearly label containers holding kerosene

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