Ask Jon Eakes

HOW CAN I INCREASE THE EFFICIENCY OF ELECTRICAL BASEBOARD HEATERS?

Last Updated: Tuesday, December 15th, 2009, Created: Tuesday, December 15th, 2009

Baseboard resistance heaters convert almost 100 percent of their supplied electricity into heat. We can't get much better efficiency than that (without a heat pump). However, we can improve how the heat is used.

-- Thermostats mounted directly on the heaters are slow to respond to temperature changes, and cause wide fluctuations in room temperature. They should be used in hallways and seldom used rooms, but not in the living and dining rooms. These areas should have wall-mounted thermostats.

-- Improperly placed thermostats produce inefficient heating. Central thermostats should be located in a central area, away from cold walls and drafts.

-- New electronic thermostats make a radical difference with electrical baseboard heaters. When you don't need a lot of heat, the old thermostats go on, then off several minutes later, then on several minutes later -- giving you full heat, then no heat, then full heat. Both extremes are uncomfortable, but that was unavoidable with the slow reaction time of the old thermostats. The electronic thermostats check the temperature every 3 to 5 seconds and turn the baseboard on or off as needed. The end result of this rapid fire switching is that the when not much heat is needed, the baseboard stays at a perfect degree of "warm". The electric element doesn't have time to completely heat up, or completely cool off. Properly placed wall mounted electronic thermostats have taken baseboard heaters from one of the most uncomfortable heating systems to one of the most comfortable.

-- Baseboards heaters do not circulate the air well in the house but they do allow for easy zone heating in cool bedrooms and basements with activity areas. A difference of only one degree Celsius on your thermostat does make a difference in your heating bill. Also zone heating balances the heat demand differences between the basement and the rest of the house, giving you even comfort.

-- Baseboard and other heaters mounted on exterior walls lose much heat to the wall directly behind them. A piece of 1/2 in cork (bulletin board stuff) placed between the heater and the wall will provide a firm, safe mounting and significant insulation from the cold wall.

Generally when heating with electrical resistance heat, watt for watt they all have the same heat output -- the real differences are the heat distribution. Baseboards heaters spread out the heat the best; sending warm air up along the cold wall for a large portion of the wall. When you concentrate that same heat in a smaller area, the room receives the same amount of heat, but much of the wall does not get it while it is the hottest. This actually leaves the walls a little cooler which can give a feeling of cooler because of radiation losses (your body loosing to the cold wall). The total overall house heat consumption will not change, but the local immediate comfort levels could be different with a less even feeling of warmth. When you move to larger squares, like Convect air, they become so vertically large that they no longer fit under windows. This moves the heat source away from the primary cold source, leaving the windows much colder than with other heating systems. Notice that all forced air heat ducts in cold Canada are installed under windows. The classy looking Convect air concept was developed in the mild regions in the south of France. There are times when the spread out size of a baseboard is a problem and that can justify a change. Other than for that, my preferred electrical radiation system is very standard, inexpensive baseboards but - very importantly - using wall mounted electronic thermostats as discussed above.

Keywords:
Electrical, Heating, Radiators