

Dual Radiant Heat Systems – Hydronic Floors and Tulikivi

Question:

Do you recommend installing one of your units in an open concept bungalow of 2000 Sqft. built on a slab with hydronic in floor radiant heat? My concern is that the heat produced will turn off the heat to the floor.

Answer:

It is not unusual in Northern Europe to see both a radiant floor and a Tulikivi employed in the same space. In those climate conditions the radiant floor provides the basic heat for the home and the Tulikivi provides the extra warmth and comfort required without the necessity of running the floor temperature higher than comfortable. In more temperate climates a dual system is less necessary. Following are some of the advantages of a Tulikivi over a radiant floor if you are, as I assume living in a more temperate climate. In the fall and spring when some heat is needed to take the chill off the air a Tulikivi can more quickly do this than a radiant floor system. You can get surface temperatures in the 200 degree range from a masonry heater while typical temperatures in the low 80's from a radiant floor take much longer to impact the living space. The 200 degree temperatures from the masonry heater will not overheat the living area like the 400-600 degree temperatures one finds when employing a wood stove is a similar situation. When temperatures exceed 200 degrees the heat source very quickly turns from radiantly heating solid surfaces in the room to convectively heating the air in the room and thus you lose the radiant heat comfort advantage.

The design of your radiant floor system in a concrete slab should be engineered carefully. You need to be sure that it heats up quickly enough for your general climate conditions and that it does not store too much heat if you have widely fluctuating climate conditions. Too much thermal mass with high outdoor temperatures can result in overheating. Over heating in fluctuating temperature conditions is less likely with a Tulikivi because there is much less mass involved than with a slab floor of 2000 square feet. A typical Tulikivi weighs 2500 – 10,000 lbs. A 2000 square foot 4-inch slab floor has approximately 667 cubic feet of concrete (2000 / 3), the typical weight of concrete is 145 lbs per cubic foot (667 x 145) for a total of approximately 96,715 lbs.

Another significant advantage of a Tulikivi is that if you should lose electric power you have a secure source of heat since no external power is required for a Tulikivi.

I believe your concern that the heat produced by the Tulikivi will turn off the heat to the floor is misplaced. I believe it is based on the fear that the Tulikivi will heat the air temperature in the room in the way one usually associates with a wood stove with very high surface temperatures. The radiant heat from a Tulikivi raises the surface temperatures of the room in which it is located only a few degrees during a burn cycle. The air temperature in the room is stabilized by the entire mass of the room and not governed by the surface temperature of the Tulikivi. The surface temperatures in the adjoining rooms remain a few degrees cooler because they are shaded from the radiant heat of the Tulikivi. However, the air from the heated room is constantly circulating naturally to the adjoining rooms because it flows to the cooler surfaces in those rooms. The effect is that of walking from the sun into the shade while the air temperature between rooms remains almost even. Your radiant floor system will not be shut down by the heat from the Tulikivi but rather supplemented by it.

You asked a very good question. I hope my answer makes sense. I would invite any follow-up questions you might have.

Douglas Hargrave, President
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