

# Radiant Heat: The Heat of the Past and the Future

As an HVAC contractor, I am bombarded with various heating and cooling questions. From the coffee shop to the cocktail party, people have questions about their current heating systems or project they are thinking about. My email is crowded with requests for help not only from our immediate area, but also across the country. By far, the most requested item is information regarding radiant floor heating. Boucher Energy Systems has been involved with radiant heating since the 1990's. However, the early 90's was not the beginnings of radiant heating.

In fact, radiant heating is probably the oldest method of central heating there is. The very first known radiant heating systems were built by the Romans who were known for their highly advanced engineering and construction skills. Their ingenuity has stood the test of time. The Coliseum still stands. How did the Roman's heat the floors? In some buildings they had sub basements, which were really giant fireplaces. Instead of one chimney these buildings had several small chimney's surrounding the perimeter. Fires were kept lit in the basements constantly. This, in turn, warmed stone floors above! The multiple chimneys helped the heat and smoke spread more evenly across the floor. A similar concept is still used today in some remote parts of Asia. Additionally, Europeans heated their castles in much the same way during the Dark Ages.

In the 1930's, radiant heat began to make a comeback here in New England, via the advent of reliable electric circulation pumps that allowed us to economically pump warm water through a building. In these systems, copper or steel piping was embedded into the floors, or many times the ceilings of a home. Some years ago, I was asked to consult on such a system in Woonsocket, R.I. The system was still fully functional and it was clear that the home was built prior to World War II. It is the oldest, "modern" system I have ever seen still in operation.

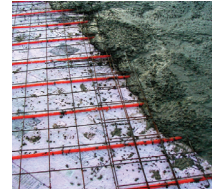
Once the war was over, there was a huge need for affordable houses for young GI's. The housing development was born. Perhaps the most well known of these was Levittown, New York. These houses were built on a simple concrete slab. The slab had tubing buried in it, looped to a boiler and presto, radiant heat for the masses. This concept was used in Massachusetts as well. The "Campanelli" houses were constructed in several towns, including Framingham and Bellingham. These homes were long slab ranches that typically had the boiler located right in the kitchen. Many are still in use today. However, many have failed. We've examined some and found slabs that have cracked and deteriorated. In time, the chemicals and ground moisture attacked the thin-wall copper tubing in the concrete. Today we have Pex tubing. This is a very specialized plastic pipe that has been in use in Europe since the early 1970's and is impervious to the chemicals that damaged the older copper and steel piped systems. I have seen Pex tubing removed from a concrete slab

poured in the early 1980s with the tubing still in perfect condition. The slab was simply being removed for an addition. There are three basic ways we install radiant floor heating today. Let's briefly examine them. One of these types of radiant installations might be able to be incorporated into your next home project.

## 1 Installing the tubing directly into a concrete slab.

A thin sheet of foam insulation is placed on the ground.

We then install the tubing on top of the foam and it is encapsulated into the concrete pour. This method is typically used for basement and garage floors and commercial buildings. It is sometimes used throughout the house, but this is rare in Massachusetts. Cost wise, this is very effective since the concrete was going to be poured already.



## 2 The "staple up" method.

The tubing is attached to the bottom of the subfloor, and is "stapled up" in an aluminum track. A good example is a beautiful kitchen we just fixed. The kitchen was built as an addition up on posts without a basement. The tile floors were beautiful, but very cold. Utilizing the staple up method we were able to make the kitchen much more comfortable without having to disturb the tile at all.



## 3 Commonly called the "On-Top" method.

This idea was pioneered by Stadler Corporation, a Massachusetts based company. Stadler has now become part of the Viega Organization. Today, there are several companies with variations of this. In an on-top installation, a thin, aluminum and plywood panel is placed "on top" of your existing subfloor. It is then covered with whatever floor covering you choose such as tile or hardwood. In many ways, this is the best installation for the Metro West area as it is easy to incorporate with our traditional wood frame construction techniques and works well in both new construction and remodeling.



Whichever method of radiant heat installation you choose, however, there is no doubt in my mind that radiant heat is the most comfortable and efficient heat that is available. Radiant heat has withstood the test of time for two thousand years. With continuing advances in materials and techniques, I would expect it to be used for the next thousand of years as well.



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