Radiant Heating 101

The descriptions and pictures below are designed to foster a basic understanding of the parts of your ***radiant heating*** system. When you call for service, we hope they will help you to identify those parts of your system that may need service. When you receive an invoice from us, we hope the information below will help clarify which parts and systems we worked on during our service visit.

Radiant heating uses hot water – usually in the range of 85 F to 120 F – generated by a boiler, an air to water heat pump, a geothermal water to water heat pump, or a domestic hot water tank – to heat a building by using a large surface area with low temperature water. Here we will discuss the particular components of the typical radiant system.
The most common application of radiant tubing is to install it in the **floor system**. It can either be buried in a thin layer of concrete, connected to the floor from below, or part of the floor itself in an aluminum skin pressed onto wood (Warmboard).

By having such a large surface area to heat a room, the water temperature that flows through the tubing can be very low, much lower than in a conventional radiator or baseboard system.

The supply and return piping to and from the radiant floor is usually **PEX plastic tubing**. PEX is very flexible, doesn't corrode or rust, is easy to connect to, and has a long service life.

Usually, the floor area is large enough to require several loops of PEX tubing that are supplied from a **manifold** in the mechanical area. Each loop has a balancing valve (the red knobs in the picture) so that floor warmth is even across the room.

The hot water used in the radiant floor system is circulated with a small circulator. This circulator is an **ECM model** that operates at variable speeds depending on the heating load.

Sometimes there will be several heating zones served by one circulator – they may be split up using **motorized zone valves** such as this Taco Sentry model.

The temperature of the water is critical to the success of a radiant floor – many times it is controlled by the outside temperature that the mixing control senses – when it is colder outside, the radiant water will be warmer, and when it is warmer outside, the radiant water will be cooler. The water temperature can be automatically adjusted by a **motorized mixing valve**.

The motorized mixing valve is controlled by a **radiant control** that looks at outside temperature and floor temperature and water temperature and adjusts the mixing valve position.

A special **radiant thermostat** is required that responds more quickly to floor temperature and can also monitor room air temperature. A system like this can connect to the internet permitting on-line observation and adjustment of thermostat settings and schedules.

Older radiant systems did not have automatic water temperature adjustment and had only one temperature setting. This meant that they were comfortable at some points in the winter but were either too hot or too cold at other times. They used a **thermostatic mixing valve**.

There are many types of radiant tubing that have been used in the past 30 years. We can commonly connect this older type to our modern PEX tubing so that we can connect to our modern manifolds.

radiant control for connection to internet

Our goal is to be **Martha's Vineyard's premier plumbing and HVAC shop** – we appreciate the opportunity to service, install, and rescue your ***radiant heating*** system!