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**What is Radiant?**

**What is the RPA?**

The Radiant Professionals Alliance (RPA) is a 20-year-old nonprofit organization dedicated to the use, promotion, education, codification and certification of water-based hydronic heating and cooling equipment systems. It is comprised of equipment manufacturers, plumbing contractors, mechanical contractors, manufacturers’ representatives, wholesale outlets and code enforcement officials throughout North America.

Our goal is to deliver the highest degree of human comfort through the utilization of the most efficient technologies available, and the proper training and certification of pipe trade designers and installers.

**What is a radiant or hydronic system?**

A hydronic system consists of a boiler or water heater, a water chilling method and a delivery system comprised of pipes and fittings, valves, pumps, and possibly a water-to-air heat exchanger. The boiler generates heat by fuel combustion, electrical resistance or through the use of a heat pump. The chiller rejects heat by means of cooling towers, or earth coupled heat exchangers, or off peak ice storage systems. The hot and cold water is piped to heat exchangers such as baseboard convectors, radiators or fan coil units located in the conditioned space.

Radiant systems circulate hot or chilled water through tubes embedded within or underneath the floor, from which heat radiates up into the occupied space, similar to the way you feel warmth from the sun on a summer day. It can also use the walls and ceilings of a structure to deliver heating and cooling comfort.

These systems bring tremendous value to home and building owners and operators by improving occupant comfort, environmental health and energy efficiency. Hydronic systems differ from conventional or forced-air systems. A forced-air system distributes the heat produced by the furnace or the coolness produced by a central air conditioner through an electrically powered fan, called a blower, which forces the air through a system of metal ducts to the rooms in your building.

**Two thousand years’ worth of technology**

On average, 90 percent of our time is spent indoors.[[1]](#footnote-1) To enable humans to spend this much time inside, mechanical equipment is necessary to provide space conditioning to control the temperature (heating and cooling), ventilation, humidity and indoor air quality. The thermal structures at Bath, England, and Rome, Italy, represent the first known type of large-surface radiant heating system. Built more than 2,000 years ago, the Roman hypocaust system consisted of raised floors made of concrete and covered in mosaic tiles. Evidence also suggests that, around the same time, the Turks were cooling their dwellings by tapping cold river water and circulating it through interstices in walls or floors.[[2]](#footnote-2)

1. US Environmental Protection Agency. *2008 Report on the Environment*. Page 2-73. 2008. [↑](#footnote-ref-1)
2. Stetiu, C. *Radiant Cooling in US Office Buildings: Towards Eliminating the Perception of Climate-Imposed Barriers*. Page 9. 1998. [↑](#footnote-ref-2)