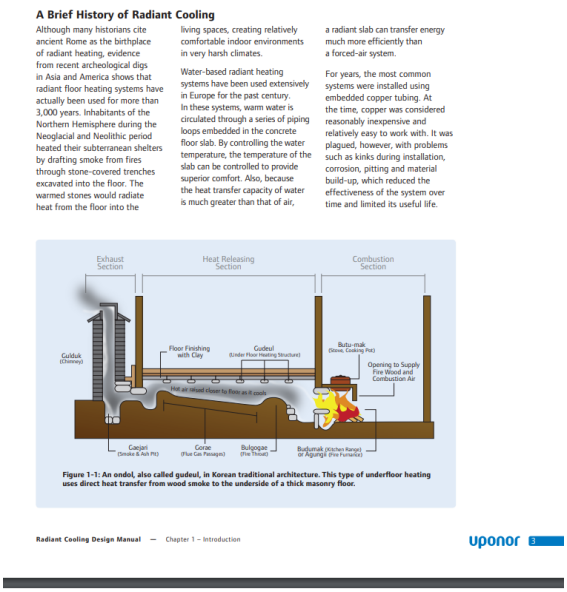

A Brief History of Radiant Cooling

Although many historians cite ancient Rome as the birthplace of radiant heating, evidence from recent archeological digs in Asia and America shows that radiant floor heating systems have actually been used for more than 3,000 years. Inhabitants of the Northern Hemisphere during the Neoglacial and Neolithic period heated their subterranean shelters by drafting smoke from fires through stone-covered trenches excavated into the floor. The warmed stones would radiate heat from the floor into the living spaces, creating relatively comfortable indoor environments in very harsh climates.

Water-based radiant heating systems have been used extensively in Europe for the past century. In these systems, warm water is circulated through a series of piping loops embedded in the concrete floor slab. By controlling the water temperature, the temperature of the slab can be controlled to provide superior comfort. Also, because the heat transfer capacity of water is much greater than that of air, a radiant slab can transfer energy much more efficiently than a forced-air system.

For years, the most common systems were installed using embedded copper tubing. At the time, copper was considered reasonably inexpensive and relatively easy to work with. It was plagued, however, with problems such as kinks during installation, corrosion, pitting and material build-up, which reduced the effectiveness of the system over time and limited its useful life.

Figure 1-1: An ondol, also called gudeul, in Korean traditional architecture. This type of underfloor heating uses direct heat transfer from wood smoke to the underside of a thick masonry floor.

In 1968, a German engineer named Thomas Engel developed a method to crosslink the oxygen molecules of polyethylene to create crosslinked polyethylene or PEX. The following year, Wirsbo — a Swedish company, refined the manufacturing process for PEX-a using the Engel method, and made PEX-a tubing commercially available. Wirsbo tubing revolutionized the hydronic

What is PEX-a?

PEX-a is cross-linked polyethylene tubing manufacturer using the Engel method, offering superior flexibility and kink repair. The other types of PEX are PEX-b (silane method) and PEX-c (irradiation method). For more information PEX-a tubing, see **Appendix B**.

Uponor's Radiant Cooling

Finland

A system that uses chilled water circulated through pipes in a building's floor or ceiling to provide comfortable cooling without the use of fans or ducts.

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