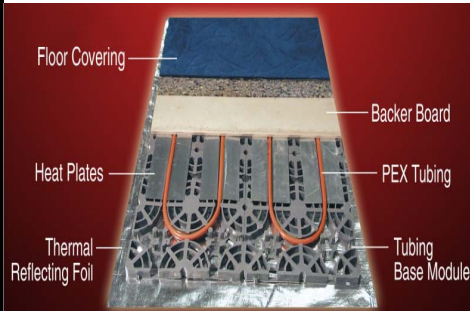









## Radiant Floor Installation Methods

Radiant Flooring Method	Description	Advantages	Disadvantages
<p><b>'Thermal Sandwich' on Sub Floor or Slab</b></p>  <p><b>EasyFloor™ System</b> <i>Radiant Warmth the Right Way<sup>SM</sup></i></p>	<p>A unique 'thermal sandwich' is created by placing proprietary TPO plastic base modules on sub-floor or slab, then routing PEX tubing through base and heat reflectors, and covering with thermal mass – typically fiber cement board.</p>	<ul style="list-style-type: none"> <li>✓ <b>Easiest, most flexible installation method</b></li> <li>✓ <b>Less weight than wet methods</b></li> <li>✓ <b>Most efficient – lower water temps</b></li> <li>✓ <b>Radiant energy focused on thermal mass</b></li> <li>✓ <b>Quick recovery time</b></li> <li>✓ <b>Contractor or do-it-yourself installation</b></li> <li>✓ <b>Only system with true radiant barrier</b></li> <li>✓ <b>Sound deadening</b></li> </ul>	<ul style="list-style-type: none"> <li>• Requires planning for additional thickness of the thermal sandwich</li> </ul>
<p><b>Wet Methods</b></p> <p><b>On Floor Concrete Slab</b></p> 	<p>Radiant tubing is placed on sub-floor or building slab. Concrete layer is poured over tubing.</p>		<ul style="list-style-type: none"> <li>• Requires planning for additional thickness of floor</li> <li>• Weight– requires sub-floor re-enforcing</li> <li>• Shrinking &amp; cracking</li> <li>• Messy, wet installation</li> <li>• Long set time – site unavailable</li> <li>• Won't flow under drywall</li> <li>• Requires high water temp</li> <li>• Slow recovery/cycle time</li> <li>• Not do-it-yourself</li> <li>• Difficult to repair</li> <li>• Requires sealer &amp; crack isolation membrane</li> </ul>
<p><b>Gypsum/Concrete Underlayment</b></p> 	<p>Lighter weight concrete by adding gypsum and other additives</p>	<ul style="list-style-type: none"> <li>• Reduces cracking and shrinkage</li> <li>• Better thermal mass</li> <li>• Better acoustic sound reduction</li> <li>• Less weight than concrete</li> <li>• Durable</li> </ul>	<ul style="list-style-type: none"> <li>• Requires planning for additional thickness of floor</li> <li>• Messy, wet installation</li> <li>• Long set time – site unavailable</li> <li>• Subject to damage during construction</li> <li>• Slow recovery/cycle time</li> <li>• Difficult to repair</li> <li>• High installation/product costs</li> <li>• Requires high water temp</li> <li>• Professional installation only</li> </ul>

Radiant Flooring Method	Description	Advantages	Disadvantages
<p><b>Dry Methods</b></p> <p><b>Under-Floor 'Staple Up'</b></p> 	<p>Thermal tubing is 'stapled up' to bottom of sub-floor. A reflective heat distribution cover is placed over tubing.</p>	<ul style="list-style-type: none"> <li>• Low cost initial cost</li> <li>• Contractor or do-it-yourself installation</li> </ul>	<ul style="list-style-type: none"> <li>• Requires exposed sub-floor – does not work in restricted areas</li> <li>• High operating costs – wood sub-floor is very poor thermal mass</li> <li>• Can be difficult installation</li> <li>• Requires high water temp</li> <li>• Weakened joists from heat</li> <li>• Not applicable to slab floors</li> </ul>
<p><b>Grooved Wood on Subfloor</b></p> 	<p>½" thick plywood sheet with grooves routed through the sheet for the placement of radiant tubing. Some manufacturers have aluminum plate <u>under</u> the plywood.</p>	<ul style="list-style-type: none"> <li>• Placed on top of subfloor</li> <li>• Easy installation in large spaces</li> </ul>	<ul style="list-style-type: none"> <li>• Limited flexibility – difficult to work in tight spaces</li> <li>• No thermal mass – poor efficiency</li> <li>• Requires high water temp</li> <li>• Requires special tools and routers to install</li> <li>• Unknown durability</li> <li>• Can be noisy when heating tubes expand/contract</li> <li>• Expensive</li> </ul>
<p><b>Grooved Wood Subfloor</b></p> 	<p>Tongue and groove plywood subfloor cut with grooves to accommodate PEX tubing. Aluminum plate bonded to surface for heat transfer.</p>	<ul style="list-style-type: none"> <li>• Single installation of subfloor and radiant delivery system</li> <li>• Structural</li> <li>• Does not require accommodation for height of radiant delivery system</li> <li>• Can be nailed and cut with conventional carpentry tools</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to change. Commits building layout at subfloor construction time.</li> <li>• No thermal mass</li> <li>• Subject to the wear and tear and mess during construction</li> <li>• Requires special tools and routers to install</li> <li>• Slippery when wet</li> <li>• Not applicable for most remodel jobs</li> <li>• No DIY Installation</li> </ul>
<p><b>Electric Heat Mats</b></p> 	<p>Heating wire secured to a fiberglass net – covered with thin cement</p>	<ul style="list-style-type: none"> <li>• Useful for supplemental heat in small rooms</li> <li>• Easy install in open spaces</li> <li>• Quiet</li> </ul>	<ul style="list-style-type: none"> <li>• Extremely high product costs</li> <li>• High operating costs – not generally suitable as primary heat source</li> <li>• No thermal mass</li> <li>• Difficult to install in irregular spaces</li> <li>• Durability?</li> </ul>
<p><b>Base Board 'Hot Water' Heating</b></p> 	<p>Baseboard unit equipped with copper tubing with 'fins' that radiate heat into room</p>	<ul style="list-style-type: none"> <li>• Can work in conjunction with other radiant methods</li> <li>• Well established method</li> <li>• Low product costs</li> </ul>	<ul style="list-style-type: none"> <li>• Less efficient than in-floor radiant heat</li> <li>• Requires <u>very</u> high water temp</li> <li>• Boiler heat sources only</li> <li>• Uneven heat like forced air systems</li> <li>• Noisy as 'radiators' heat and cool</li> <li>• Invasive – affects furniture placement, room use</li> </ul>