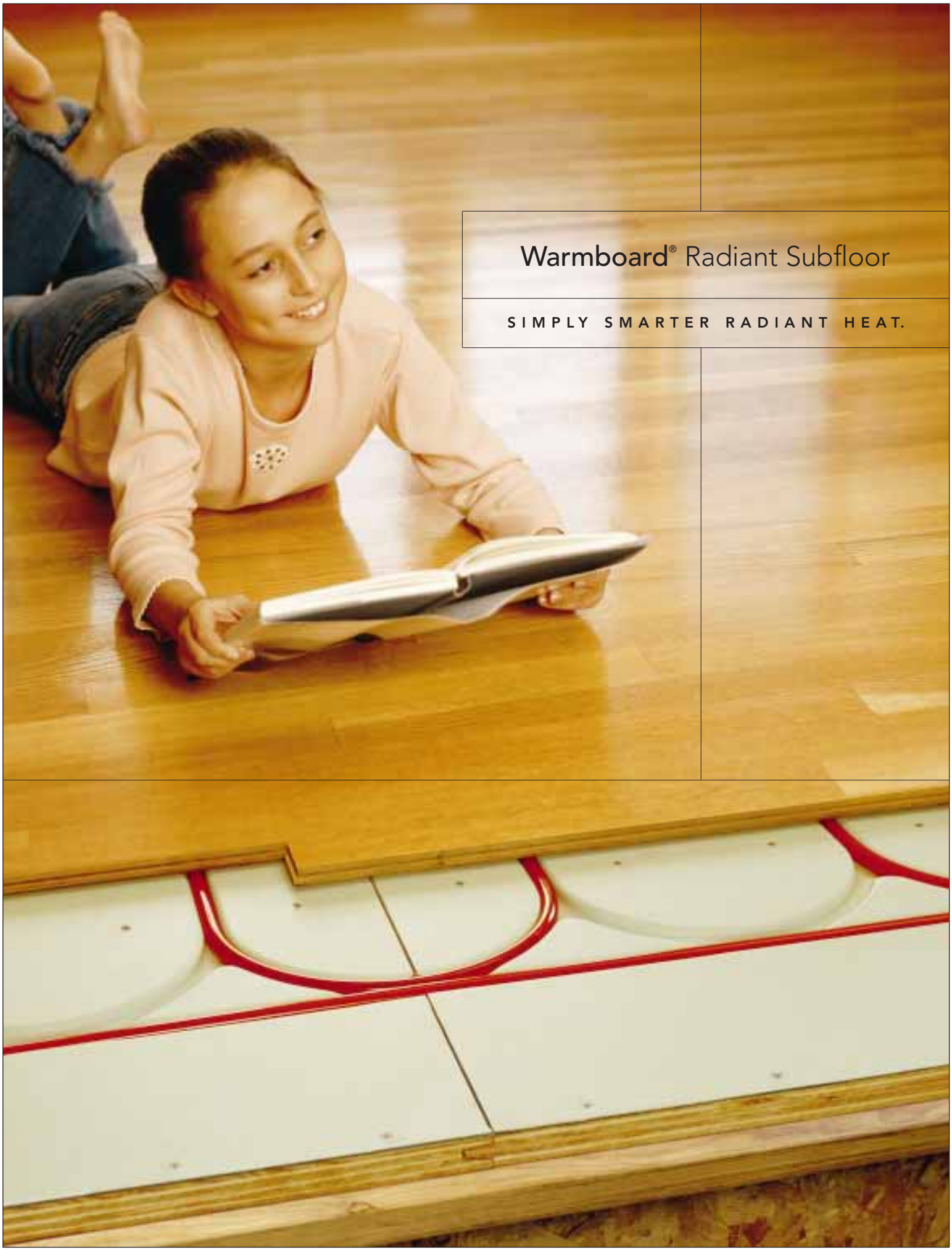


Warmboard® Radiant Subfloor

SIMPLY SMARTER RADIANT HEAT.

Most radiant heating systems haven't evolved much since the Romans built fires under their stone floors 2,000 years ago. But now there's a better way.

WARMBOARD

RADIANT SUBFLOOR.

SIMPLY SMARTER

RADIANT HEAT.

MAKE YOURSELF COMFORTABLE.

RADIANT WARMS YOU DIRECTLY.

Living in a radiant heated home provides you with a level of comfort that no other heating method can match. If you asked someone who lives in a radiant heated home what they like about it, they'd tell you "It just feels right". That's because, like the sun on your face, or the warm sand under your feet on a tropical beach, living with radiant heat is one of life's simple pleasures. By turning the floor of your home into a source of heat, you and your family will feel its warmth and comfort directly.

IT'S HEALTHIER, TOO.

Rather than blowing hot air along with dust and allergens around your home, a radiant system provides you with nothing but warmth. Your home is a cleaner, healthier environment, and everyone in it will breath easier.

INVISIBLE COMFORT.

The most remarkable thing about a radiant system is, well… nothing. With no unsightly registers, baseboard or wall radiators, there's nothing to see. Unlike forced air heating, there's no noisy fan so there's nothing to hear. If it weren't for how comfortable it keeps you and your family, you'd never even know it was there.

Whether you're building a new house, or remodeling your present home, isn't comfort one of the most important qualities you desire? Radiant has always been the most comfortable choice for heating your home. And today, the smartest radiant heating system you can buy is Warmboard.™

Radiant or Forced Air?
Radiant offers numerous benefits that forced air just can't match.

In forced air homes, overheated air rises to the ceiling leaving the level near the floor, where the people are, too cool. But, in a Warmboard home, it's just the opposite. The people are comfortable and the ceiling temperatures are reduced.

While forced air may be somewhat cheaper to install, radiant systems are more economical month after month. With a Warmboard system, your energy savings can be as high as 30%. With forced air systems, often some rooms are too hot and some rooms are too cold, in part due to heat lost (or wasted) as hot air travels through the ducts. With Warmboard, each room will be "just right".

Why live in a dust bowl? Forced air systems, even with the best filtration, still blow dust, pet dander, pollen, mold spores and dirt throughout your home.

Many Warmboard owners even report that their radiant system has reduced incidences of asthma and other allergy-related health problems. And if you've ever gotten out of bed in the middle of the night and stepped onto a cold floor, you know the value of comfortably warm floors.

WARMBOARD. SUBFLOOR AND RADIANT HEATING SYSTEM ALL-IN-ONE.

The benefits of radiant heating have been known for centuries—the Romans used it to heat their homes and baths—but it's taken until now to combine the science of thermodynamics with modern materials and construction methods to bring radiant out of the Stone Age. Typically, radiant heating systems involve a heavy slab of concrete, poured over closely spaced tubing, through which hot water is pumped—not much evolved from those ancient Roman systems. Today, there's a smarter way.

WARMBOARD'S INNOVATIVE APPROACH.

Warmboard combines a structural subfloor and a thermodynamically sophisticated radiant panel into an elegantly simple system. Warmboard begins with a stiff, strong, 1-1/8" thick, 4' X 8' sheet of tongue and groove, weather-resistant plywood. A modular pattern of channels is cut into the top surface. A thick sheet of aluminum is stamped to match the channel pattern and is permanently bonded to each panel.

EFFICIENT INSTALLATION.

Other radiant systems are more labor intensive because they're added either above or below the subfloor. Warmboard *is the subfloor.*

With Warmboard, the same labor that used to install just a subfloor, installs a major portion of your radiant system. And as the panels are installed, the modular channel pattern automatically produces the tubing layout that takes so much time to accomplish with other systems. A roll of half-inch PEX tubing (the radiant industry standard for toughness, reliability and performance) is then easily snapped into the channel to complete the hydronic circuit. The lowered labor cost designed into Warmboard saves you money throughout construction.

EFFICIENT PERFORMANCE FOR LIFE.

Warmboard's efficiency begins with installation, but really pays off, year after year, because it simply outperforms all other radiant systems.

Aluminum conducts heat 240 times better than conventional concrete and 490 times better than gypsum-based concretes. In fact, Warmboard is so conductive that with 12" on-center tubing, it outperforms even 4" on-center slab systems. Better conductivity equals faster response times, more even floor temperatures, and more heat delivered from lower water temperatures.

Lower water temperature means lower energy bills. It also means more choices in ways to heat your water. While many Warmboard systems use conventional boilers, innovative low temperature alternatives such as condensing hot water appliances, geothermal, solar panels, and ground source heat pumps work just fine.

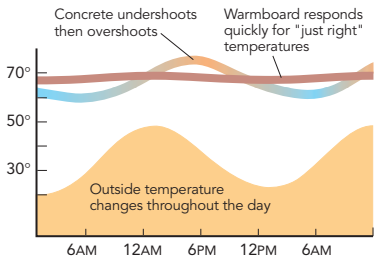
Lower water temperature also gives you more floor covering choices. Only Warmboard lets you to choose from hardwood, any type of tile, even thick wool carpets with a nice plush pad. Warmboard works beautifully with all of them.

Concrete; a poor choice for a radiant panel.

Concrete is a mediocre conductor of heat, which means you are going to need a lot more tubing and hotter water than you would with a Warmboard system. Concrete has high specific heat which is the way that a thermodynamicist would explain that you can expect to wait a long time to get warm. And concrete systems are difficult to control. Because outside temperatures can change much more rapidly than a concrete system can respond, you may have heat when you don't want it, and little or no heat when you do.

There's a reason frying pans are made out of aluminum and not concrete. Aluminum conducts heat hundreds of times better.

Concrete also increases the cost of installing most flooring materials, especially hardwoods. And the unyielding nature of concrete makes it uncomfortable to stand on for any length of time. Is it any wonder there's a need for something new?



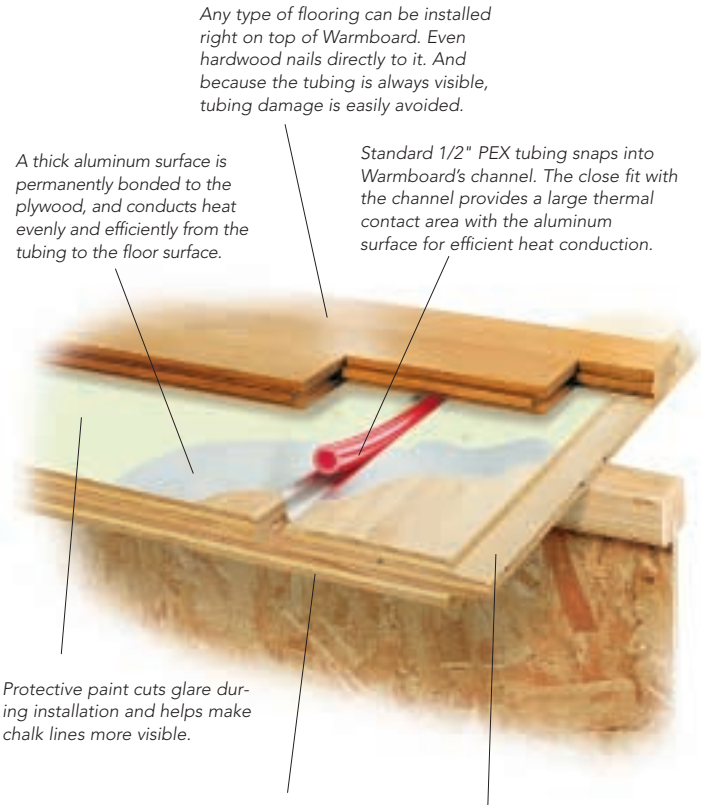
Concrete systems are slow to respond to temperature changes. But Warmboard responds quickly, so you always have the right temperature at the right time.

BUILDERS AND ARCHITECTS ARE COMFORTABLE WITH WARMBOARD, TOO.

Warmboard gives architects an elegant alternative to forced air, and in the end, a more pleasing environment for the homeowner. One they'll be satisfied with—and proud of—for years to come.

Warmboard is easy to work with, almost from the moment it's specified. Unlike heavy slab systems, Warmboard doesn't create extra structural problems, which is especially important for designs that require long clear spans, or in regions of high seismic loads. And since it's an integral part of platform-framed construction, no special details are needed. Walls and staircases won't require any special framing to accommodate concrete slab thickness.

And at Warmboard we do the working drawings for you. We work from your plans to provide the optimum tubing layout and zoning plan. You'll get a set of drawings that will satisfy even the most particular contractor or building official.



Warmboard solves problems for builders too. Anybody who has installed subfloor can install Warmboard. Everything that attaches to it goes in conventionally.

Slab systems, on the other hand, challenge builders in many ways. They introduce moisture—as much as a gallon per square foot—and with it, mold, mildew, and warping that can be almost impossible to rectify. And they're rarely flat and level, are difficult to repair, and drive up costs in many ways that may not be directly reflected in the radiant system bid.

Warmboard is simply smarter for everyone involved, whether you're an architect, a builder, or you have a family that wants to enjoy the most comfortable heating system.

Choose Warmboard for more floor covering choices.

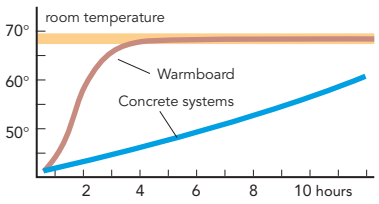
Because other radiant systems are not as efficient as Warmboard, they force some unhappy choices. Either run extremely hot water through the system, or limit your choice of floor coverings to something very, very thin.

Hardwood? No problem. Wool carpets and thick pads? Bring it on. Tile, stone, or resilient flooring? Perfect. Warmboard is so efficient, it works beautifully no matter what it's under.

Warmboard, though, doesn't limit anything. You can choose any type of floor covering you want. You can nail hardwood or carpet tack strips right to it, or screw tile underlayment right over it.

Heat now. Not later.

When you want heat, you want it now, not tomorrow. Warmboard systems are so responsive, they warm up practically on command, making them ideal for that guest bedroom, vacation home, or rental—anywhere occupancy is intermittent, but the need for heat is immediate.



Typical concrete slab-based radiant systems can take all day to bring a cold room up to a comfortable temperature. Warmboard can do it in just hours.

Limited Warranty.
This is simple, too. Warmboard subfloor heating panels are warranted to be free from all substantive defects in material and workmanship for the normal life of the structure or work improvement into which they are initially installed.

HELP AND INFORMATION.

You're getting warmer.
Thanks for your interest in Warmboard. For further information, or the name of your nearest Warmboard distributor, please contact us. You can also find us on the web at **www.warmboard.com.**

warmboard®
RADIANT SUBFLOOR

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Fax: 831-685-9278
Email: info@warmboard.com

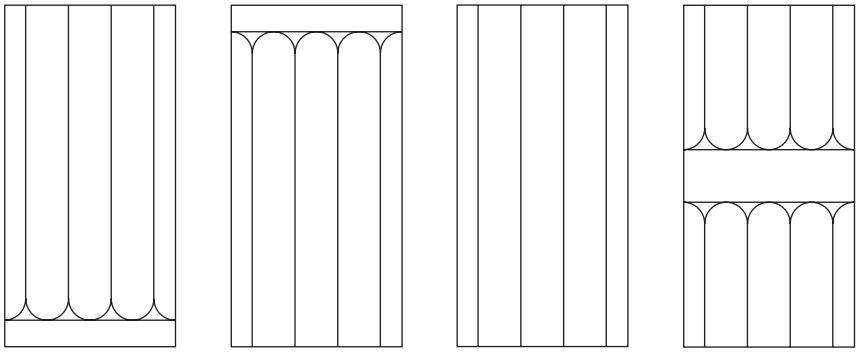
www.warmboard.com

Warmboard is also available from:

United States Patent No. 5,788,152

Four Panel Types.
Part of the elegant simplicity of Warmboard is that just four panel types can accommodate virtually any home design. We'll work closely with your architect to provide you with the optimum Warmboard system design for your home. The resulting construction documents you will receive are the best in the radiant industry, and will help streamline approval by your local building officials.

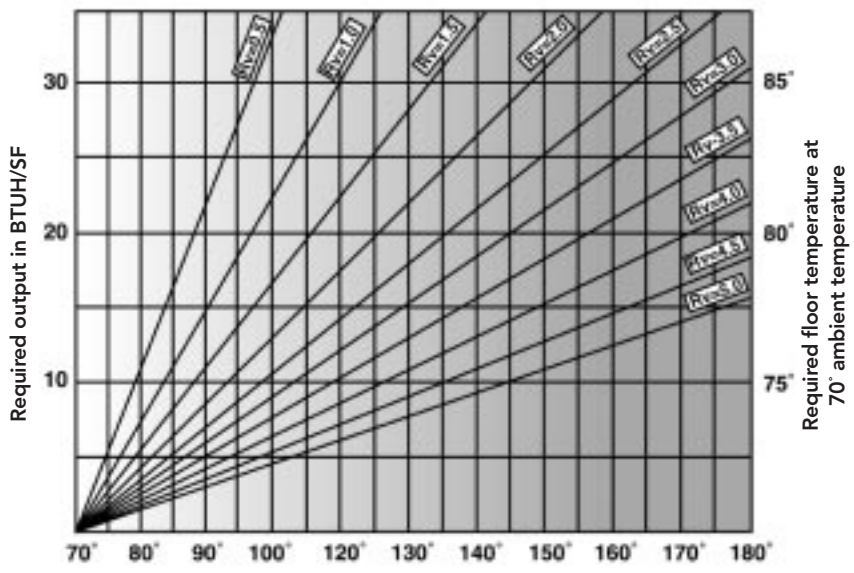
We'll also work closely with your contractor to ensure cost-effective bidding and a trouble-free installation. But remember, Warmboard installs just like a traditional subfloor. So your contractor already has the skills and tools he needs. After just one Warmboard installation, most contractors say they'd rather install Warmboard than any other radiant system. It's that simple.



Required Water Temperature in Degrees Fahrenheit

This chart displays typical outputs expected. Warmboard is one component of a complete system. Complete system design shall be performed in accordance with both the Radiant Panel Association (RPA) Guidelines, the manufacturers' recommendations for components supplied by others, and is the responsibility of the system designer.

Assumes a designed ambient air temperature of 70˚ fahrenheit



Average of supply/return water temperature at manifold for good dynamic performance

Notes:

- Steady state performance will require 10% lower supply temperature.
- Rv = floor covering resistance value
- Warmboard recommends maximum floor temperature of 85˚.
- Assumes minimum R21 insulation below floor.

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