How Ultra-Fin works

The Ultra-Fin System pipes hot water throughout the joist spaces using half inch tubing, where aluminum fins attach to the tubing which radiates the heat and warms the entire floor. In these joist spaces, heat from the tubing is transferred to attached aluminum fins by conduction.

The fins then radiate this heat and warm the air in the joist spaces to create hot air convection. The heated air rises and warms the floor uniformly, and the floor in turn radiates the heat throughout the living space above.

The heated air travels upwards by convection and warms the entire floor system. The heated floor system radiates the heat upwards, passing uniform and efficient heat to the living space above.

Ultra-Fin is tried & tested

Performance Test Results

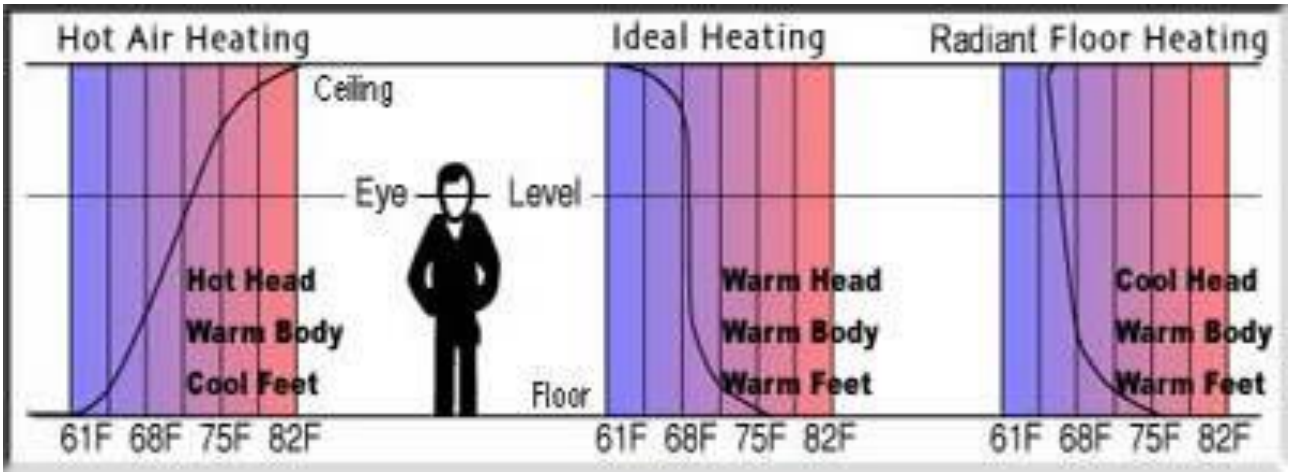
Room Temperature	Water Temperature	Measured BTU Output	Inside Joist Temperature	Floor Temperature
72˚	150˚	27.3 BTU/sq ft	90˚	86˚
72˚	180˚	41.6 BTU/sq ft	105˚	85˚
60˚	150˚	33.4 BTU/sq ft	85˚	67˚
60˚	180˚	46.5 BTU/sq ft	96˚	71˚

Third party tested

Warnock Hersey

Ultra-Fin Heating System has distinct advantages over other systems. Builders and home owners chose it for several reasons:

No Special Flooring Required
Ultra-Fin doesn't require special flooring to conduct or distribute heat, and the uniform quality of Ultra-Fin's heat doesn't damage or limit the use of hardwood flooring.
Healthier Radiant System
Ultra-Fin delivers more heat with a cooler floor compared to other radiant systems.
Gentle, Draft-free Heat
Natural convection between floor and ceiling provides uniform heating, blocks chilling drafts and eliminates hot and cold spots.
Quicker Response
With the entire floor acting as a radiator, each room warms up quickly, effectively and efficiently.
Clean, Healthy Heat
Ultra-Fin's radiant heat doesn't blow dust and germs through your house like forced air.



Quiet
No blowing air means no noisy fans, and no pings, clicks or other noises associated with expanding or contracting heat ducts.

Room by Room Comfort
Zone controls (thermostats) in individual rooms allow the heat to be regulated locally, providing maximum energy savings.

Rugged and Durable
The Ultra-Fin System uses aluminum Ultra-Fins and composite tubing, so it won't rust or corrode.

Decorating freedom
Ultra-Fin doesn't interfere with furniture placement or drapes, and it won't clash with home decor.

Ultra-Fin is more cost effective compared to conventional heating systems because:

Requires less than 1/2 the tubing of other types of under-floor heating systems.

Allows the heating loop to start and end at the boiler.

Allows each room to have a separate zone, separate thermostat and desired temperature.

Heats the joist region by convection rather than radiation.

Requires less labor to install. Reduces initial construction costs.

Will this type of below-floor heating system harm hardwood, tile or rug flooring?

No. Although the boiler temperatures can be as high as 200°F (normally180°F), the actual floor subsurface never exceeds 83°F, which is well below body temperature. This is in direct contrast to in-floor concrete lab heating systems, where the narrow strips of flooring directly in contact with the pipe can reach temperatures as high as 140°F. This localized heating can cause cracking in hardwood or tile flooring and discoloration in hardwood and linoleum flooring.

Is it harmful to run the boiler run at 180°F?

No. Most boilers are designed to operate at these high temperatures. Low temperature boilers need to be designed in such a way as to avoid flue condensates which are very corrosive. In fact, most boilers are factory-set to operate at 180°F.

Is the use of a low temperature boiler more cost effective than a high temperature boiler?

Yes. Running a condensing boiler at 120°F is approximately 2% more efficient than running it at 180°F. However, today's houses are so thermally efficient that the cost of heating the house is only a fraction of what it costs to heat the domestic hot water. Since domestic hot water can be supplied by either a boiler or a hot water tank, some home owners save money by using a high-efficiency boiler to heat their domestic hot water. They trade a 2% loss on the heating for a 10% gain on the domestic hot water. One MacDuffco customer commented: "...We appear to be saving between $15 - $20 per month over an electric hot water tank."

Does having a hot water heating system that also heats the domestic hot water mean that energy is wasted through the summer?

No. The reverse is actually true.

The boiler operates only when there is a demand. With an Ultra-Fin system, all of the zone valves are located in the boiler room so there are no remote heating headers that require constant heating. Also, since these, small and compact, high-efficient boilers are more efficient and better insulated than a domestic hot water tank it takes less energy to operate and loses less energy to the surroundings.

Does the Ultra-Fin System need the boiler pumps to run continuously?

No. It is well known that erosion is a major concern in the use of plastic pipe, and certain uses of plastic pipe are banned for this reason. Only with the Ultra-Fin System can each room can be individually zoned with the zone control in the boiler room. When heat is requested, the zone control opens, the pump starts up, and the boiler comes on. When heat is no longer required, the zone valve closes, the pump turns off, and the furnace shuts down. So the pump only operates for only as long as heat is required. You save heating costs by heating only those rooms that need heat, and not rooms that are already warm enough.

How long has the Ultra-Fin System been in use?

The Ultra-Fin System has been used to heat homes since 1996. It has been installed in homes in Canada and the United States, including locations where outside temperatures drop as low as minus 60 °F.

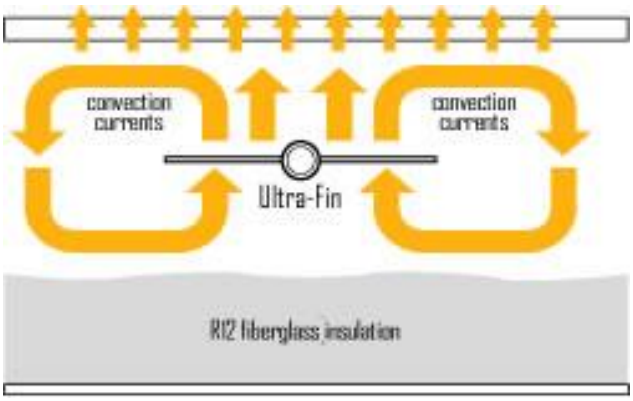
Patented Ultra-Fins are louvered aluminum plates designed to attach to 5/8" O.D. (1/2" nominal) composite hot water tubing. Heat from the composite tubing is conducted to the Ultra-Fins, which in turn transfer the heat to the surrounding air space through their efficient louver design.

Each installed Ultra-Fin is actually made from a pair of aluminum plates or 'fins'. The installer places one plate on top of the tubing and the other below, then completes the installation by lining-up the pre-stamped rivet holes and attaching 6 pop rivets which clamp the Ultra-Fins securely to the pipe. This allows complete heat transfer from the pipe to the Ultra-Fins.

What's the difference?

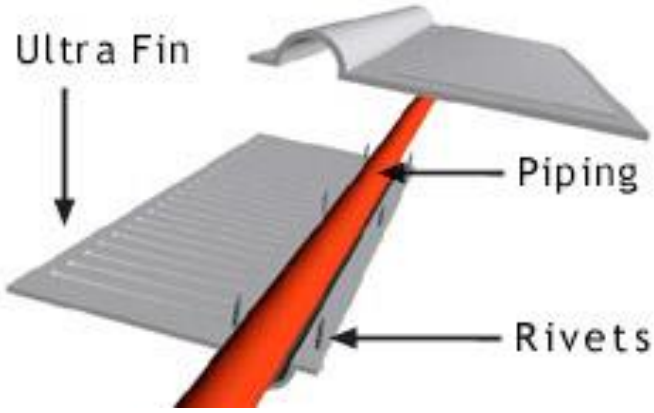
Traditional radiant floor systems are based on heat contact transfer technology, where hot water tubing makes direct contact with the floor system. These systems require special flooring or poured concrete slabs. Compared to Ultra-Fin system this technology is lethargic, complex and costly.

Ultra-fin creates new efficiency with one basic innovation: it uses hot water heated tubing and the Ultra-Fins to rapidly transfer the heat to create hot air convection in the joist spaces beneath the floor, converting the entire floor system into a giant heat radiator. No special flooring or concrete is required.



The result is uniform warmth and comfort - at a cost and convenience difficult to match.

The Ultra Fins are designed to effectively transfer heat from the hot water in the composite pipe to the surrounding air. They are composed of two separate stamped aluminum fins pop riveted together. One fin is placed on top of the pipe and the other fin is place below the pipe. The 6 holes are lined up and 6 pop rivets are attached.



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How many ways to pipe it? There are many ways to design circuits. See **piping design** for options.