ULTRA-FIN: RADIANT HEATING

Welcome to Ultra-Fin

Ultra-Fin is the leader in cost efficient and high comfort radiant floor heating. Ultra-Fin is a hydronic system designed specifically for wood-frame housing that is simple to install, and is compatible with all floor coverings including carpet, tile, slate and hardwood.

How Ultra-Fin Works

The Ultra-fin system uses tubing to circulate hot water through the under-floor joist spaces, where heat is conducted to louvered aluminum Ultra-Fins attached to the tubing. The Ultra-Fins radiate the heat and warm the air in the joint spaces, creating hot air convection. The heated air warms the floor uniformly and the floor radiates gentle heat throughout the living space above.

GREAT PERFORMANCE WITH SIMPLE INSTALLATION

1. TUBING INSTALLATION

When you install Ultra-Fin, you start by installing the tubing. You can either run the tubing parallel to the joists using SnakeHangers™ or you can drill the joists and run the tubing through the holes.

2. ATTACH THE ULTRA-FINS

You attach the aluminum Ultra-Fins by lapping two fins over a section of tubing, then inserting two TurnKeys and giving them a 90-degree turn.

What Makes Ultra-Fin Different?

Traditional radiant floor systems are based on heat contact transfer technology where hot water tubing makes direct contact with floor layers. Compared to Ultra-Fin, these systems are overly complicated, time-consuming to install, provide lethargic heat responses, and require complicated construction measures such as extra floor layers or concrete.

Ultra-Fin creates new efficiency by generating hot air convection inside regular wood-frame floor systems. By converting the entire floor system into a giant heat radiator, Ultra-Fin generates uniform warmth and comfort at unprecedented cost savings and convenience.
If you plan to use a modulating boiler, your system will need a few more Ultra-Fins to distribute the heat with the lower operating temperature. If you plan to use a modulating boiler, your system will need a few more Ultra-Fins to distribute the heat with the lower operating temperature. If you plan to use a modulating boiler, your system will need a few more Ultra-Fins to distribute the heat with the lower operating temperature. If you plan to use a modulating boiler, your system will need a few more Ultra-Fins to distribute the heat with the lower operating temperature. If you plan to use a high temperature boiler, you want to design your system according to the manufacturer’s instructions for your hardwood product, and review the checklist below.

Hardwood Checklist

- Before your hardwood floors are installed, make sure that all plastering and concrete work is completely dry.
- Make sure the home heating system is operating.
- Make sure the home has been heated at 72ºF (22ºC) for at least five days before flooring delivery.
- Allow concrete to cure for a minimum of 30 days before hardwood floors are installed.
- Climate: Flooring materials at room temperature for at least 10 - 14 days prior to installation.
- Use a moisture meter to measure the moisture content in the sub-floor. Moisture content should be between 6% and 12%. If the moisture content exceeds 12%, turn up the heat and open the basement windows 1/2.
- If the moisture content is less than 4%, for flooring greater than 3" wide, the difference in humidity between the sub floor and the hardwood floor must be less than 4%. For flooring greater than 3" wide, the difference in humidity between the sub floor and the hardwood floor must be less than 2%.

This checklist is for general consultation only. It is not intended to replace the guidelines and instructions of your flooring manufacturer.

Sample Layouts: Ultra-Fin MODULATING 100°-150°F

Tubing through joists

HANGING

Tubing parallel to joists

DRILLING

Sample Layouts: Ultra-Fin MODULATING 100°-150°F

HANGING

Tubing parallel to joists

DRILLING

Sample Layouts: Ultra-Fin HIGH TEMP 150°-180°F

HANGING

Tubing parallel to joists

DRILLING

Sample Layouts: Ultra-Fin HIGH TEMP 150°-180°F

HANGING

Tubing parallel to joists

DRILLING

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Tubing through joists

HANGING

Tubing parallel to joists

DRILLING

If you plan to use a high temperature boiler, you want to design your system according to Ultra-Fin High Temp. Depending on your joist spacing you will typically need Ultra-Fin’s installed at 24” centers.
Hanging The Tubing With Snake Hangers

Attaching Ultra-Fins

Attaching the Ultra-fins is easy, just follow these steps:

1. Lap two Ultra-Fins over a section of tubing and insert two TurnKeys.
2. Fasten the Ultra-Fins together by twisting both TurnKeys 90°.

Insulating Above Heated Areas

Insulating Above Unheated & Exposed Areas

Ultra-Fin SideKey

Ultra-Fin Can Operate at the Same Temperature as Removed Baseboard Radiators.

Over Heated Area _10” JOIST

Subfloor Sheathing

GWB Ceiling

Ultra-Fin

R-12 Fiberglass Insulation

Over Exposed Area _10” JOIST

Subfloor Sheathing

GWB Ceiling

Ultra-Fin

R-20 Fiberglass Insulation

Over Unheated Area _10” JOIST

Subfloor Sheathing

GWB Ceiling

Ultra-Fin

R-8 Reflective Insulation

You Must Always Have A Minimum 2” Air Space Around The Ultra-Fins

The Ultra-Fin system is typically 2” to 3” below subfloor. Safe from nails and screws.

NOTE:

For all Ultra-Fin installations, ensure the insulation rests flush with the bottom of the joists, and that a minimum 2” air space is always maintained between the Ultra-Fins and the insulation.

You can choose to install Ultra-Fin from above, before the floor sheathing is installed.

1. Lap two Ultra-Fins over a section of tubing and insert one SideKey.
2. Fasten the Ultra-Fins together by twisting the SideKey 90°.
3. Done. Finish by attaching the SideKey to the joist with a fastener.

TM

SIDE

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Done. Finish by attaching the SideKey to the joist with a fastener.

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### Design a Tubing & Ultra-Fin Layout

#### A. Calculate the Number of Heating Zones

Look at the overall square footage of the home and the total number of rooms. How many rooms does the home have? With the exception of small interior spaces such as hallways and storage rooms, the number of heating zones you will want to install. You need the following information:

1. **Calc software** to calculate the BTU's and materials required for your home and the surrounding climate. Use Ultra-Fin’s Ultra-Heat-Loss and Material Calculation Program to determine the number of heating zones you will want to install.

#### B. Sketch the Floor Plan

Sketch the floor plan and mark out the heating zones you intend to install. Complete with length and width measurements for each zone.

#### C. Measure the Joist Spacing

The joist spacing in the floor system will usually be 12", 16" or 19". In rare instances, it could be 24”. When you have determined the joist spacing, you are ready to calculate the tubing spacing for each zone.

**Heat-Loss and Material Calculation**

When installing an Ultra-Fin system, you need an installation layout that fits the home and the surrounding climate. Use Ultra-Fin’s Ultra-Calc software to calculate the BTU’s and materials required for your installation. You need the following information:

- The type of heat source your family will use (e.g., boiler, heat pump, etc.
- The anticipated operating temperature of your heat source.
- The average mean temperature for your area or location, referred to as design temperature in the Ultra-Calc program (click the Design Temp tab).
- The length and width of each room in the house.
- The ceiling heights of each room.
- The size and R-factor of every window, and whether or not they are single or double glazed.
- The R-factor of the insulation in the walls and ceilings (or at least the insulation type and thickness).

Enter these numbers into the Ultra-Calc program on your computer. Ultra-Calc will tell you:

- Tubing and Ultra-Fin material and spacing requirements.
- BTU requirements for the boiler/hot water source.

For standard installation, joists should be drilled 3” below floor sheathing, spaced according to the calculations you made. However, there are some exceptions to this rule:

- When the joists are manufactured “true joists,” refer to the joist manufacturer’s instructions regarding drilling in the joist web before automatically drilling 3" below sheathing.
- When the joists are 9½” or less in depth, you may still drill 3” below floor sheathing, but you must use a thinner, special insulation product.

**Drilling Joists**

Drill 1" diameter holes and install 1/2" tubing (5/8" OD). Larger diameter tubing may be used up to 3/4" (19.0 OD) with larger sized turnkey’s specified. If you plan to use tubing larger than 1/2", (5/8" OD), please refer to our Approved Tubing List located in the installation section of www.ultra-fin.com.

**Caution!**

Do not use tubing with an EVOH barrier on the exterior of the tubing. However, tubing manufactured with a polyethylene layer extruded over the EVOH barrier layer is approved.

**Approved Tubing for use with Ultra-Fin**

Using a tubing brand from our Approved Tubing List will ensure a silent interface between the PEX tubing when attached or crossing wood joist. Installing other types of tubing may create a slight ticking noise as the tubing expands during operation. This noise is created by the outer layer of EVOH barrier when it is in direct contact with wood. To design a silent heating system, be sure to install Ultra-Fin with approved tubing only.

Please refer to our Approved Tubing List located in the installation section of www.ultra-fin.com.

**Tubing Selection**

Ultra-Fin is typically designed and installed with 1/2" tubing (5/8" OD). Larger diameter tubing may be used up to 3/4" (19.0 OD) with larger sized turnkey’s specified.

*Note* Ultra-Fin highly recommends having separate heating zones (tubing circuits) for each room in the house.

**Pulling Tubing**

If you choose to install the joists and run the tubing through the joists, use the following procedure to pull the tubing through the holes:

- For each heating zone, feed one continuous length of tubing through the holes and back to the supply/return manifold. Measure the length of tubing you need to complete the remaining half of the zone and cut it to the manifold. Roll that length off the tubing coil and cut it, allowing some extra length to be safe. (See diagram below)

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You can download the Ultra-Calc program for free on our website www.ultra-fin.com.