

**LTO**  
PRODUCTS, INC.



**WARMFLOORS**.com

HYDRONIC RADIANT FLOOR HEATING

*Installation Manual*

# Introduction

*Heat Loss Calculation  
Typical Heat Sources  
Tubing Spacing  
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**A Heat Loss Calculation Excel form may be downloaded from  
[www.WarmmFloors.com/heat\\_loss\\_calculation](http://www.WarmmFloors.com/heat_loss_calculation)**

To perform an accurate calculation, you will need the following information:

- Location
- Floor Plan
- Outside Design Temperature - Typically the coldest day of the season.
- Inside Design Temperature - Desired inside temperature.
- Heat Source
- Floor Type
- Window and Door
- Specific requirements

The WarmmFloors Heat Loss Calculation will document all values including fluid requirement.

## Typical Heat Sources for Floor Heating

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### The following steps are recommended:

1. Determine the type of construction being installed
2. Make a heat loss calculation
3. Determine the number of zones needed
4. Determine heat source

The heat source choice depends on availability and regional cost. The system is readily adaptable to a dual source heat supply. The heat source is typically between 80° F and 160° F. This low temperature requirement makes this heating system suitable to virtually any heat source.

### Typical Heat Sources:

- Natural gas - up to 96 % efficient
- Propane (LP) - Up to 96 % efficient
- Oil fired up to 80% efficient
- Solar heat up to - infinity efficient
- Water to water heat pump (heat multiplier) up to 350 % efficient
- Direct resistance electric (Water Heater) - with off peak power - up to 99 % efficient
- Wood stove with hydronic pick-up
- Waste heat from industrial process
- Waste heat from incineration
- Air to water heat pump (in warmer climates)
- Corn burning stove (with water heat exchanger)

### Heat Source less than 130° F

Suitable for: Heavyweight construction, ground slab construction, suspended concrete flooring, or tile flooring.

Depending on the region, the most cost effective are:

- Solar Panels
- Heat Pump,
- Natural gas
- Propane

### Heat Source less than 160° F

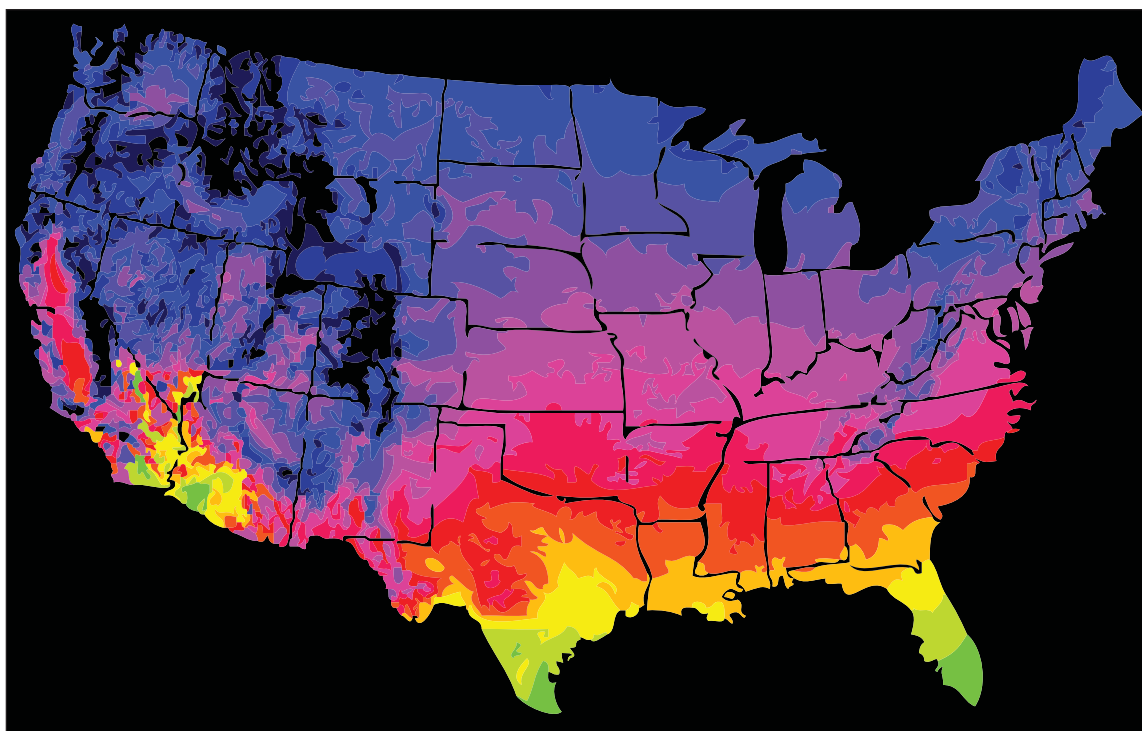
Suitable for: Lightweight construction, vinyl floor, or carpeted floor.

Natural Gas or LP Gas - Features should include the following description:

- Heat source should transfer the heat inside the water tank for high efficiency heat transfer.
- Heat source should be a condensing design to operate at low temperature and at a maximum efficiency.
- Sealed combustion air intake and exhaust should be piped for max. efficiency to avoid oxygen consumed from inside the dwelling.

*Other heat sources may be used, please consult your local heating contractor for availability.*

## Determining Tube Spacing



A degree day is the average temperature below (for heating) or above (for cooling) temperature for 24 hr period above or below 65 degrees F.

The Heating / Cooling Degree Days is a value that is monitored in your area by your local weather station and utility power companies. Additional information may be found on your utility bill.

Tubing Spacing	Tubing Length ( )' = Sq. foot area
8"	( )' × 1.5 = Tubing Length
12"	( )' × 1 = Tubing Length

1. Select your geographical area.
2. Select tubing spacing for area.
3. Calculate tubing length using corresponding formula.

## Basic Tools Recommended

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- Decoiler Stand WFM-9940
- Decoiler Wheel WFM-9956
- Tubing Cutter WFR-TC1
- Wire Twister WFR-9006
- Air Compressor - 1/2 Hp 100 Psi WFR-9212
- Air Compressor - 1/4 Hp 100 Psi WFR-9112
- Air Hose with quick disconnect couplings
- Air Stapler - Bostitch WFR-1500
- Extension Cord - 120 Volt Purchase Locally
- Angle Drill- 3/8" Chuck WFR-9675
- Fill / Transfer Pump Kit WFM-9300
- Basic Hand Tools
- Flashlight
- Level
- Holding Bucket
- Hose / Faucet Adaptor

## Basic Supplies Recommended

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- Poly Sheets - To Protect Area WFR-5206
- Spare Couplings 5/8 - 7/8" WFR-1455 & WFR-1477
- Wall Anchors
- Cable Ties
- Lift Clips WFM-5105-C
- Stample Tube Clamps WFM-5050-C & WFM-5070-C
- Staples - 5/8" Long 1/4" Crown WFR-9625
  - See Section 2, page 5
- Booster Pump Kit WFM-9300
  - See Section 4, page 4