Quik Trak™ Design & Installation Manual

WIRSBO®

2nd Edition

Bringing *comfort* to life

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2nd
EDITION
2000

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Wirsbo Quik Trak™

Over the past several years, radiant floor heating has become the single fastest growing segment of the HVAC industry. Homeowners enjoy the comfort and efficiency that a radiant floor heating system provides because it offers numerous advantages over the more traditional alternatives such as forced air heating.

In the new millennium there will be more remodeling and retrofit construction in the United States than new construction. More and more homeowners will seek the benefits of radiant floor heating for their homes by:

- Warming tile or marble in kitchens, bathroom and entryway floors
- Heating cold basements

Wirsbo has made it easier for you to keep up with the demand for radiant heating with Quik Trak™. This cost-effective patented wood panel system is engineered for wood frame construction and offers an alternative to joist heating and poured floor underlayment installations. Only ½" thick, Quik Trak™ adds only minimal height to your floors.

Wirsbo Quik Trak™ enables you to put the comfort of radiant floor heating into your customers' new or existing homes with less hassles!

Fast, Easy Installation

Wirsbo's Quik Trak™ system provides fast, easy and trouble free installation of radiant floor heating in retrofit, remodeling and new construction projects. The system incorporates Wirsbo's 5/16" hePEX™ plus tubing, Quik Trak™ and Return Trak™ panels, (These panels are 48" long x ½" thick and come in widths of either 7" or 10"), Wirsbo brass manifolds and QS20 Fittings. Quik Trak™ panels are designed with a center groove that provides a tight fit for the Wirsbo 5/16" tubing. In many installations, the low profile of the panels require only a ½" alteration of the finished floors, doors and entryways.

The Quik Trak™ system is easily installed in many types of floor construction:

- Over a suspended wood subfloor
- Over an existing concrete slab
- In wall or ceiling installations

Tools that you will need to install the Quik Trak™ system:

- Table Saw, Power Miter Saw or Circular Saw to cut or trim the panels to the correct size. ***A carbide blade is recommended.***
- Electric or cordless drill with a No. 2 Phillips bit to drive screws and a 5/8" drill bit for drilling holes for the supply and return runs.
- Quik Drive™ Kit (Optional)
  Allows the installer to stand and drive screws for faster installation. Kit includes carrying case, screw pouch, Dewalt™ drill, Quik Drive™ extender and strip screw adapter head.
- Shop Vacuum
  Necessary to clean out the panel groove prior to tubing installation.
- Caulk Gun
- Hammer
- ¾" Wood Chisel
- Tape Measure
- Square
- Chalk Line
- Rubber Mallet
- Tin Snips
- Extension Cord

Important

Take the time to carefully plan the layout of your Quik Trak™ design prior to installation. It will save you considerable labor costs on your first project.

7" Quik Trak™ Calculations

Heat Loss

Wirsbo Radiant Express computer design program performs heat loss calculations and automatically determines the amount of tubing, GPM flow, water temperatures and other information necessary for your specific installation.

If you do not have Wirsbo's Radiant Express, perform a room-by-room heat loss. From the heat loss information, divide the Btu/h load per room by the available net floor area (i.e., area that will have installed panels) to determine the Btu/h load per square foot of net floor space.

$$\frac{\text{Btu/h/Room}}{\text{Net Floor Area (paneled)}} = \text{Btu/h/ft.}^2$$

See the design sheets on pages 5 & 6 for calculation assistance.

When designing the system, Wirsbo recommends that surface temperatures should not exceed 80° F for a solid wood floor and 87.5° F for any other floor surface.

Note: *If the Btu/h/ft.^{2} load exceeds the Btu/h output of the Quik Trak™ panels or recommended surface temperature, supplemental heat is required. Wirsbo's Radiant Express will give you this information. You can deliver supplemental heat to a specific area by using radiant wall or ceiling, baseboard, radiators or hot water convectors.*

7" Quik Trak™ Panel Calculations

To determine the number of Quik Trak™ panels and Return Trak™ panels, use the following formulas:

Net Floor Area x 0.386 = # Quik Trak™ panels (round up to the next whole number)

Net Floor Area x 0.043 = # Return Trak™ panels (round up to the next whole number)

Example

Given a 375 square foot room,

375 x 0.386 = 145 Quik Trak™ panels needed

375 x 0.043 = 16 Return Trak™ panels needed

These simple formulas provide you with the number of Quik Trak™ and Return Trak™ panels needed for each room.

7" Quik Trak™ Tubing Calculations

To calculate the amount of tubing needed, multiply the net floor area by 1.7. Divide the total amount of tubing into equal lengths that are less than 250' including the leader length for the loop. Leader length is the distance from the manifold to the room and back to the manifold plus the vertical distance from the floor to the manifold.

Note: The leader length is doubled to account for supply and return runs.

Example

Given a 375 square foot room with a leader length of 15' between the room and the manifold location, calculate the number of loops required and the average loop length.

375 square ft. x 1.7 = 638 linear ft.

638 ÷ 3 = 213 average active loop length

15' (leader length) x 2 = 30'

213 + 30 = 243' total loop length

The 375 square ft. room will require 3 loops of 243'.

The design assistance sheets on page 5 & 6 will help with the process.

Note: Do not exceed 250' for the total loop length.

10" Quik Trak™ Panel Calculations

To determine the number of Quik Trak™ panels and Return Trak™ panels, use the following formulas:

Net Floor Area x 0.28 = # Quik Trak™ panels (round up to the next whole number)

Net Floor Area x 0.043 = # Return Trak™ panels (round up to the next whole number)

Example
Given a 375 square foot room,

375 x 0.28 = 105 Quik Trak™ panels needed

375 x 0.043 = 16 Return Trak™ panels needed

These simple formulas provide you with the number of Quik Trak™ and Return Trak™ panels needed for each room.

10" Quik Trak™ Tubing Calculations

To calculate the amount of tubing needed, multiply the net floor area by 1.25. Divide the total amount of tubing into equal lengths that are less than 250' including the leader length for the loop. Leader length is the distance from the manifold to the room and back to the manifold plus the vertical distance from the floor to the manifold.

Note: The leader length is doubled to account for supply and return runs.

Example
Given a 375 square foot room with a leader length of 7' between the room and the manifold location, calculate the number of loops required and the average loop length.

375 square ft. x 1.25 = 469 linear ft.

469 ÷ 2 = 234 average active loop length

7' (leader length) x 2 = 14'

234 + 14 = 248' total loop length

The 375 square ft. room will require 2 loops of 248'.

The design assistance sheet on page 6 will help with the process.

Note: *Do not exceed 250' for the total loop length.*

7" Design Assistance Example

PROJECT NAME Example **Manifold No.** 1

		Loop 1	Loop 2	Loop 3	Loop 4	Loop 5	Loop 6	Loop 7	Loop 8	Loop 9	Loop 10
	Room Name	Dining	Dining	Kitchen	Kitchen	Powder Rm	Family	Family	Family		
	Room Set Point Temperature	65		65		70	65				
A	Net Floor Area	175		225		75	420				
B	Room Heat Loss (Btu/h)	3780		4050		2625	6510				
C	Btu/h per sq. ft. (**B / A**)	21.6		18		30	15.5				
D	Floor Surface Temperature	76		74		85	73				
E	Floor Covering R-value	0.8		0.5		0.03	2.5				
F	Quik Trak™ panels	68		87		29	163				
G	Return Trak™ panels	8		10		4	18				
H	Leader Length	34	34	42	42	55	10	10	10		
I	Panel Loop Length	149	149	191	191	128	238	238	238		
J	Total Loop Length (**H + I**)	183	183	233	233	183	248	248	248		
K	Supply Water Temperature	120	120	112	112	125	135	135	135		
L	Flow (GPM)	0.24	0.24	0.3	0.3	0.36	0.24	0.24	0.24		
M	Head Loss (in feet of head)	4	4	10.8	10.8	13.5	11	11	11		
N	Balancing (½ turns from closed)	2.9	2.9	3.7	3.7	2.9	4	4	4		

Material Totals

O	Quik Trak™ Panels (Total of **F**)	347
P	Return Trak™ Panels (Total of **G**)	40
Q	Total Tubing (Total of **J**)	1759'
R	Quik Trak™ Sealant (**Q / 110**)	16
S	Number of Screws {**(O+P) x 10**}	3870

Manifold Totals

Highest Temperature in Column **K**	135 deg.
Manifold GPM (Total of **L**)	2.16 gpm
Highest Head Loss in Column **M**	13.5'

Room Set Point temperature is normally 65° F for radiant floor heating

A Square foot area of room to have Quik Trak™ panels installed

B Input load from a heat loss program

C **B/A** = Btu/h load per square foot of heated space

D Refer to the charts on page 20 (or room set temperature and C/2)

E Refer to the table on page 21

F Multiply **A** by 0.386 and round to next whole number

G Multiply **A** by 0.043 and round to next whole number

H Vertical and horizontal distance from the manifold location to the panels

I Use the following steps to calculate the panel loop length:
Step 1: **A** x 1.7/250 (Round to the next whole number)= Number of loops
Step 2: **A** x 1.7/ # of loops = Panel loop length
(If there are 2 loops, you will start the next room at loop #3, - As shown above.)

J **(H + I)** Leader length and panel loop length combined **cannot exceed 250'**

K Refer to the charts on page 22

L Refer to the charts on page 24

M Refer to the charts on page 25

N **J x 4;** then divide by longest loop length for the manifold. This is the number of ½ turns from the closed position on the balancing valve located on the return manifold. (The longest loop will be 4.)

NOTE: This is a quick reference sheet to design a Quik Trak™ system. For a more accurate design, use the Wirsbo Radaint Express™ heat loss program.

PROJECT NAME _____ **Manifold No.** _____

		Loop 1	Loop 2	Loop 3	Loop 4	Loop 5	Loop 6	Loop 7	Loop 8	Loop 9	Loop 10
	Room Name										
	Room Set Point Temperature										
A	Net Floor Area										
B	Room Heat Loss (Btu/h)										
C	Btu/h per sq. ft. (**B / A**)										
D	Floor Surface Temperature										
E	Floor Covering R-value										
F	Quik Trak™ panels										
G	Return Trak™ panels										
H	Leader Length										
I	Panel Loop Length										
J	Total Loop Length (**H + I**)										
K	Supply Water Temperature										
L	Flow (GPM)										
M	Head Loss (in feet of head)										
N	Balancing (½ turns from closed)										

Material Totals

O	Quik Trak™ Panels (Total of **F**)	
P	Return Trak™ Panels (Total of **G**)	
Q	Total Tubing (Total of **J**)	
R	Quik Trak™ Sealant (**Q / 110**)	
S	Number of Screws {**(O+P) x 10**}	

Manifold Totals

Highest Temperature in Column **K**	
Manifold GPM (Total of **L**)	
Highest Head Loss in Column **M**	

Room Set Point temperature is normally 65° F for radiant floor heating

A Square foot area of room to have Quik Trak™ panels installed

B Input load from a heat loss program

C **B/A** = Btu/h load per square foot of heated space

D Refer to the charts on page 20 (or room set temperature and C/2)

E Refer to the table on page 21

F Multiply **A** by 0.386 and round to next whole number

G Multiply **A** by 0.043 and round to next whole number

H Vertical and horizontal distance from the manifold location to the panels

I Use the following steps to calculate the panel loop length:
Step 1: **A** x 1.7/250 (Round to the next whole number)= Number of loops
Step 2: **A** x 1.7/ # of loops = Panel loop length

J **(H + I)** Leader length and panel loop length combined **cannot exceed 250'**

K Refer to the charts on page 22

L Refer to the charts on page 24

M Refer to the charts on page 25

N **J x 4;** then divide by longest loop length for the manifold. This is the number of ½ turns from the closed position on the balancing valve located on the return manifold. (The longest loop will be 4.)

NOTE: This is a quick reference sheet to design a Quik Trak™ system. For a more accurate design, use the Wirsbo Radiant Express™ heat loss program.

10" Design Assistance Sheet

PROJECT NAME _____ **Manifold No.** _____

		Loop 1	Loop 2	Loop 3	Loop 4	Loop 5	Loop 6	Loop 7	Loop 8	Loop 9	Loop 10
	Room Name										
	Room Set Point Temperature										
A	Net Floor Area										
B	Room Heat Loss (Btu/h)										
C	Btu/h per sq. ft. (**B / A**)										
D	Floor Surface Temperature										
E	Floor Covering R-value										
F	Quik Trak™ panels										
G	Return Trak™ panels										
H	Leader Length										
I	Panel Loop Length										
J	Total Loop Length (**H + I**)										
K	Supply Water Temperature										
L	Flow (GPM)										
M	Head Loss (in feet of head)										
N	Balancing (½ turns from closed)										

Material Totals

O	Quik Trak™ Panels (Total of **F**)	
P	Return Trak™ Panels (Total of **G**)	
Q	Total Tubing (Total of **J**)	
R	Quik Trak™ Sealant (**Q / 110**)	
S	Number of Screws {**(O+P) x 10**}	

Manifold Totals

Highest Temperature in Column **K**	
Manifold GPM (Total of **L**)	
Highest Head Loss in Column **M**	

Room Set Point temperature is normally 65° F for radiant floor heating

A Square foot area of room to have Quik Trak™ panels installed

B Input load from a heat loss program

C **B/A** = Btu/h load per square foot of heated space

D Refer to the charts on page 20 (or room set temperature and C/2)

E Refer to the table on page 21

F Multiply **A** by 0.28 and round to next whole number

G Multiply **A** by 0.043 and round to next whole number

H Vertical and horizontal distance from the manifold location to the panels

I Use the following steps to calculate the panel loop length:
Step 1: **A** x 1.25/250 (Round to the next whole number)= Number of loops
Step 2: **A** x 1.25/ # of loops = Panel loop length

J **(H + I)** Leader length and panel loop length combined **cannot exceed 250'**

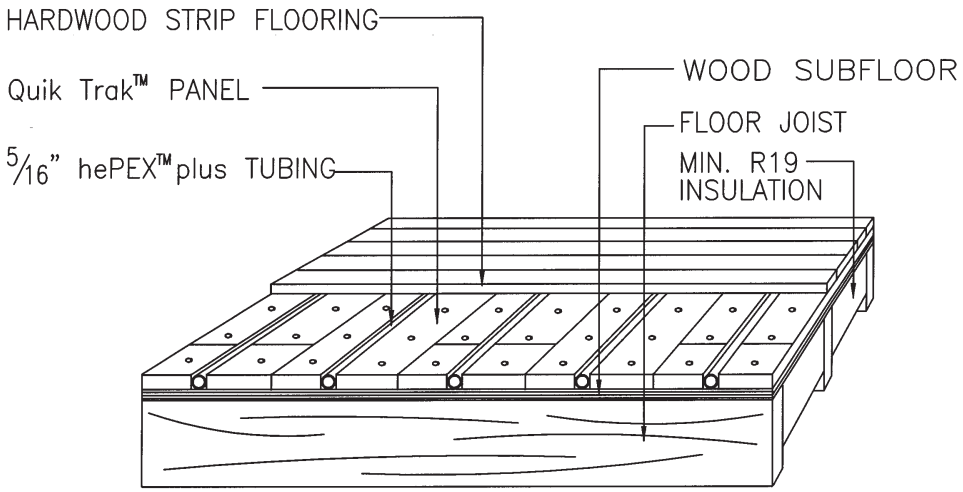
K Refer to the charts on page 23

L Refer to the charts on page 24

M Refer to the charts on page 25

N **J x 4;** then divide by longest loop length for the manifold. This is the number of ½ turns from the closed position on the balancing valve located on the return manifold. (The longest loop will be 4.)

NOTE: This is a quick reference sheet to design a Quik Trak™ system. For a more accurate design, use the Wirsbo Radaint Express™ heat loss program.



Quik Trak™ Installed Above A Subfloor With Hardwood Finished Floor

How: Quik Trak™ panels are laid out over a plywood subfloor perpendicular to the finished wood floor (see page 15). Make sure to stagger the seams of the Quik Trak™ as shown in **Figure 5** on page 16. Panels should be secured to the subfloor with 1¼" screws. To start, secure one side of the panel with a screw on each end. This allows for quick realignment if needed. When the panels are properly laid out, secure each panel with 10 screws, five on each side of the groove for full length panels.

After the panels are secured, use a vacuum to clean debris out of the panel grooves. Next, apply a thin (⅛") bead of Wirsbo Quik Trak™ Sealant throughout the entire length of the groove. The sealant is 100 percent silicone and acts as an adhesive agent while promoting good heat transfer from the tubing to the panel.

Begin the installation of the tubing as described on page 18.

Where: This application is used in residential construction as an alternative to both joist heating and poured floor underlayment installations. Quik Trak™ is also beneficial when the finished floor material is hardwood. Installers can actually see the tubing when laying down their hardwood. This method has several advantages over both options, including minimal floor build-up, no concrete and increased Btu/h output potential over joist heating.

What To Look For: Hardwood floors should always be installed in accordance with the flooring manufacturer's instructions. Nails for the finished wood floor must be a minimum of 1½" away from the tubing.

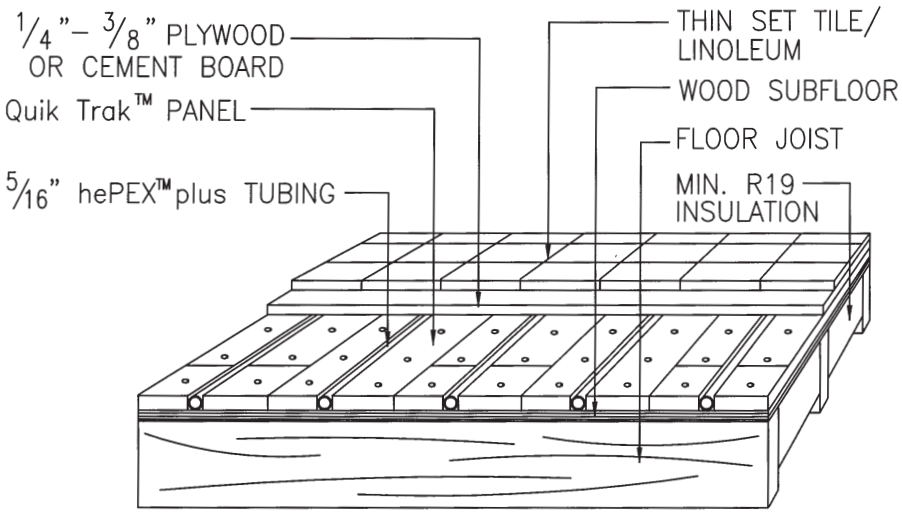
Proper insulation is critical to the performance of Quik Trak™. A minimum of R-19 is recommended in between the floor joists.

Notes:

- *Surface temperature for hardwood floors should not exceed 80° F.*
- *Dead spots need to be filled in with plywood strips or other suitable filling material.*

In all Quik Trak™ applications, the maximum loop length for the 5/16" hePEX™ plus tubing is 250' including leader lengths. Flow rates for all Quik Trak™ installations are calculated to a 20° temperature differential.

Quik Trak™ Installation Methods



Quik Trak™ Installed Above A Subfloor With Tile/Linoleum Flooring

How: Quik Trak™ panels are laid out over a plywood subfloor, perpendicular to the floor joists (see page 15). This strengthens and stabilizes the subfloor/ underlayment sandwich. Make sure to stagger the seams of the Quik Trak™ as shown in **Figure 5** on page 16. Panels should be secured to the subfloor with 1¼" screws. To start, secure one side of the panel with a screw on each end. This allows for quick realignment if needed. When the panels are properly laid out, secure each panel with 10 screws, five on each side of the groove for full length panels.

After the panels are secured, use a vacuum to clean debris out of the panel grooves. Next, apply a thin (⅛") bead of Wirsbo Quik Trak™ Sealant throughout the entire length of the groove. The sealant is 100 percent silicone and acts as an adhesive agent while promoting good heat transfer from the tubing to the panel.

Begin the installation of the tubing as described on page 18.

Where: This application is used in residential construction as an alternative to both joist heating and poured floor underlayment installations. This method has several advantages over both options, including minimal floor build-up, no concrete and increased output potential over joist heating.

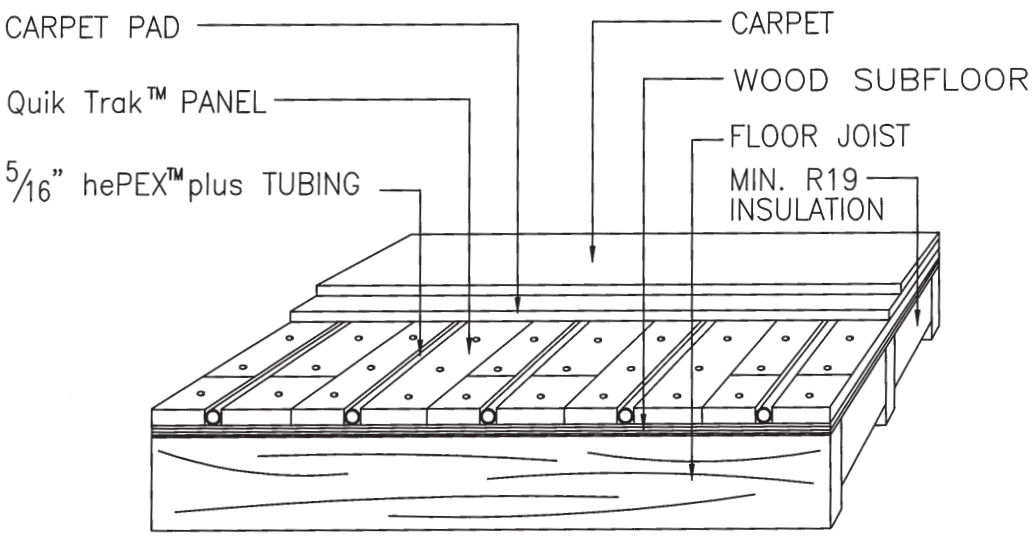
What To Look For: In tile or linoleum installations, the finished flooring manufacturers may require that a minimum ¼" layer of plywood or a ⅜" layer of cement board is placed over the Quik Trak™ panels. This gives a flat, solid base for a thinset application.

Proper insulation is critical to the performance of Quik Trak™. A minimum of R-19 is recommended in between the floor joists.

Notes:

- *Surface temperature for hardwood floors should not exceed 80° F.*
- *Dead spots need to be filled in with plywood strips or other suitable filling material.*

In all Quik Trak™ applications, the maximum loop length for the 5/16" hePEX™ plus tubing is 250' including leader lengths. Flow rates for all Quik Trak™ installations are calculated to a 20° temperature differential.



Quik Trak™ Installed Above A Subfloor With Carpet

How: Quik Trak™ panels are laid out over a plywood subfloor (see page 15). Make sure to stagger the seams of the Quik Trak™ as shown in **Figure 5** on page 16. Panels should be secured to the subfloor with 1¼" screws. To start, secure one side of the panel with a screw on each end. This allows for quick realignment if needed. When the panels are properly laid out, secure each panel with 10 screws, five on each side of the groove for full length panels.

After the panels are secured, use a vacuum to clean debris out of the panel grooves. Next, apply a thin (⅛") bead of Wirsbo Quik Trak™ Sealant throughout the entire length of the groove. The sealant is 100 percent silicone and acts as an adhesive agent while promoting good heat transfer from the tubing to the panel.

Begin the installation of the tubing as described on page 18.

Where: This application is used in residential construction as an alternative to both joist heating and poured floor underlayment installations. This method has several advantages over both options, including minimal floor build-up, no concrete and increased output potential over joist heating.

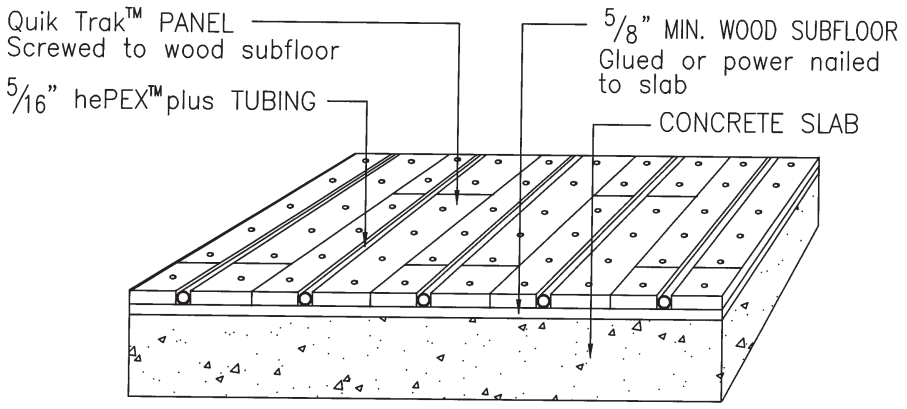
What To Look For: Carpet and pad may be installed directly over the Quik Trak™ panels. Care must be taken to make sure all dead spots are filled in with Quik Trak™ panels, Return Trak™ panels or plywood filler. Padding may be glued directly to Quik Trak™ panels. Carpet tack strips must be a minimum of 1½" away from the tubing.

Proper insulation is critical to the performance of Quik Trak™. A minimum of R-19 is recommended in between the floor joists.

Note:

- *Dead spots need to be filled in with plywood strips or other suitable filling material.*

In all Quik Trak™ applications, the maximum loop length for the 5/16" hePEX™ plus tubing is 250' including leader lengths. Flow rates for all Quik Trak™ installations are calculated to a 20° temperature differential.



Quik Trak™ Installed Over Concrete

How: First, a layer of ⅝" or ¾" plywood subfloor must be installed over the concrete slab. The plywood can be adhered directly to the concrete if a vapor barrier is not required. If a vapor barrier is required, then the plywood must be power-nailed to the concrete slab.

Make sure to stagger the seams of the Quik Trak™ as shown in **Figure 5** on page 16. Panels should be secured to the plywood with 1¼" screws. To start, secure one side of the panel with a screw on each end. This allows for quick realignment if needed. When the panels are properly laid out, secure each panel with 10 screws, five on each side of the groove for full length panels.

After the panels are secured, use a vacuum to clean debris out of the panel grooves. Next, apply a thin (⅛") bead of Wirsbo Quik Trak™ Sealant throughout the entire length of the groove. The sealant is 100 percent silicone and acts as an adhesive agent while promoting good heat transfer from the tubing to the panel.

Begin the installation of the tubing as described on page 18.

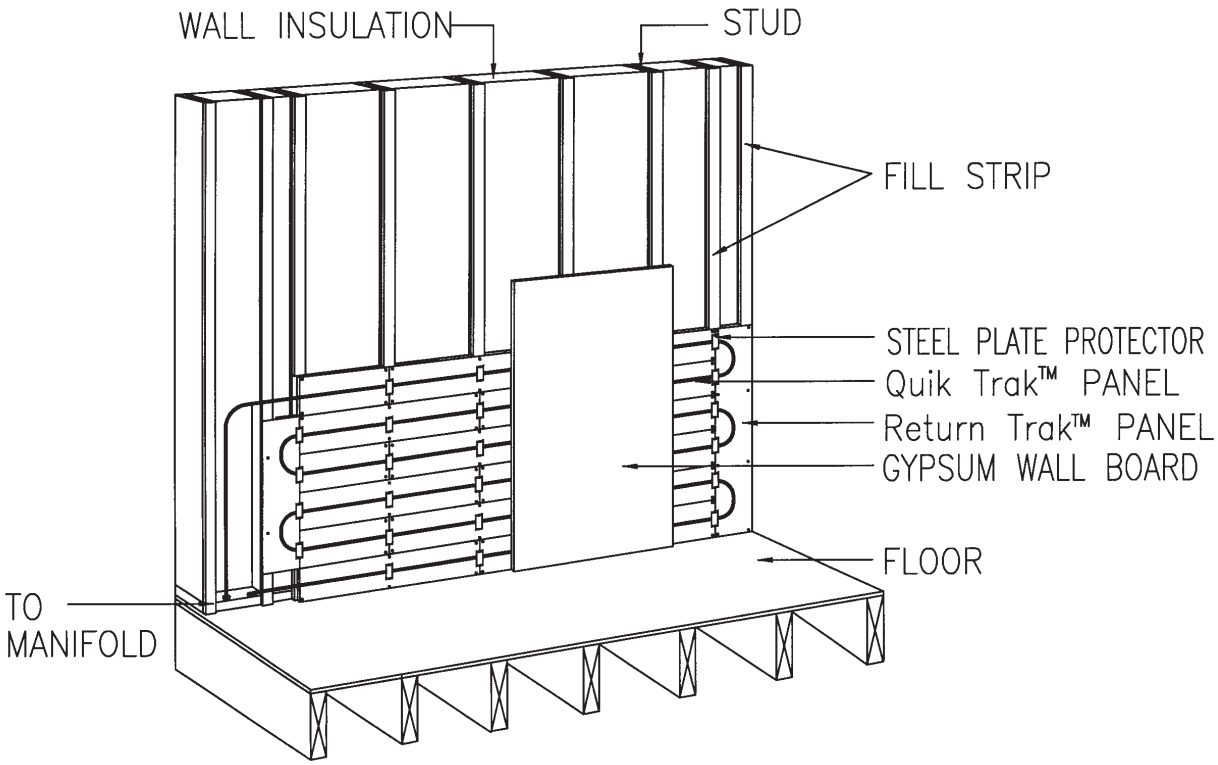
Where: This application is used in residential construction over existing concrete slabs. The plywood base together with the Quik Trak™ panel only adds 1⅛" or 1¼" in height. It is an excellent solution when retrofitting or remodeling a cold basement.

What To Look For: A high water table will adversely affect the performance of this application. If there is moisture present or if the existing slab is not equipped with a vapor barrier, one must be installed over the slab prior to installing the plywood base and Quik Trak™ panels.

Notes:

- *Use of a vapor barrier will prohibit the installation of a plywood subfloor with glue. The plywood must be power nailed to the concrete slab.*
- *In a basement or walk-out application, it is very important that perimeter and edge insulation is installed for proper design performance.*
- *Dead spots need to be filled in with plywood strips or other suitable filling material.*

In all Quik Trak™ applications, the maximum loop length for the 5/16" hePEX™ plus tubing is 250' including leader lengths. Flow rates for all Quik Trak™ installations are calculated to a 20° temperature differential.



Quik Trak™ Wall/Ceiling Installation

How: Starting at the floor level on the outside wall, install Quik Trak™ panels parallel to the floor. Panels should be screwed to the studs on both sides of the groove with minimum ¾" screws. After the panels are installed, attach ½" furring strips to the remainder of the stud wall to provide an even base for the sheetrock.

To install the tubing, drill two ⅝" holes in the bottom wall plate opposite the Return Trak™ panel. Feed the supply through the ⅝" hole and attach it to the supply manifold. Vacuum the groove. Apply a ⅛" bead of Quik Trak™ sealant. Firmly press tubing into the groove. Feed the return to the second ⅝" hole and attach it to the return manifold. Lastly, attach steel protector plates where the tubing crosses the studs to protect the tubing from puncture.

Important: Wirsbo suggests that the installer supply a tubing layout to the end user indicating radiant ceiling or radiant wall locations for future reference.

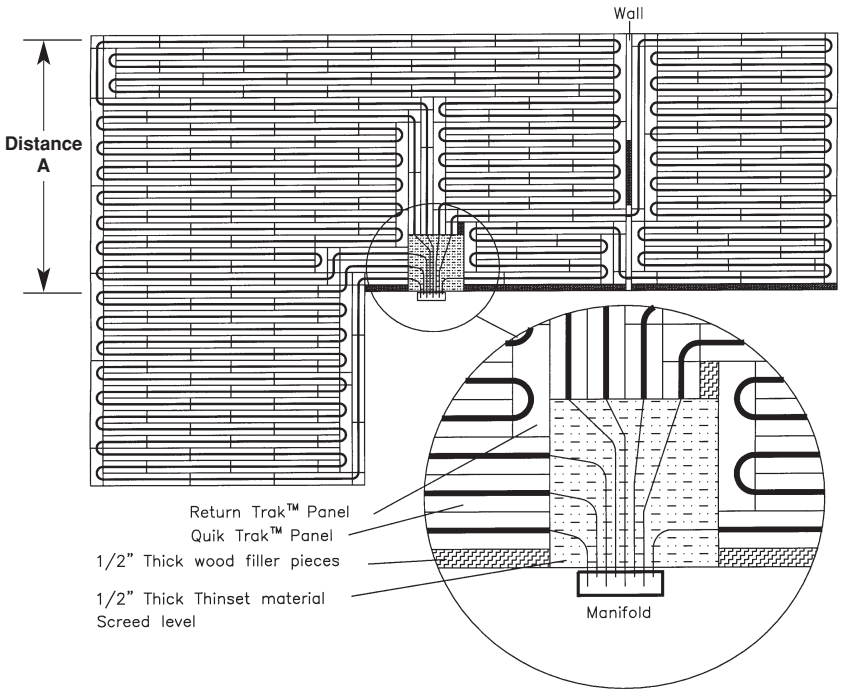
Where: Radiant wall and radiant ceiling installations are a low cost alternative to radiant floor heating and are often installed when radiant floor is not viable as in some retrofit applications. In addition, both are often used in bedrooms where its relative low cost and quick response time are valued. Radiant wall and radiant ceiling installations are also used where the heat loss of a room requires supplemental heat in order to satisfy design conditions.

What To Look For: Tubing should not be installed in an area where pictures may be hung. Maintain 6" clearances from bottom of windows.

Note: *Design water temperature should not exceed 120° F.*

In all Quik Trak™ applications, the maximum loop length for the 5/16" hePEX™ plus tubing is 250' including leader lengths. Flow rates for all Quik Trak™ installations are calculated to a 20° temperature differential.

Quik Trak™ Installation Methods



Planning The Quik Trak™ Installation

In a concrete application, installation time will be improved by carefully planning the placement of manifolds and leaders. As shown above, the leaders must run above the floor.

To save time, draw the Quik Trak™ layout on a piece of paper before you begin the installation.

1. Split the areas that will have panels into even areas based on the number of loops. The number of loops can be determined by using the Design Assistance Sheets on pages 5 & 6 or your Wirsbo Radiant Express printout.
2. Select the manifold location.
3. Choose the panel width. For a 7" panel draw a 28" square in front of the manifold location or a 30" square for a 10" panel. The manifold location is the area that will contain the tightly spaced tubing running from the manifold to the panels. This area may be larger or smaller depending upon the number of loops.
4. To begin the panel installation, measure the distance from the outside wall back to the manifold wall (see distance A) . Divide by .583 **(for 7" panels)** or .833 (**for 10" panels)** to determine the number of panel rows needed. Any remaining areas less than the width of a panel can be filled with ½" plywood.
5. Place the panels that will be used for the leaders. Do not screw them down at this time.
6. Place the Quik Trak™ and Return Trak™ panels to determine the overall placement. When the panels are in place, screw the panels down using only two screws. This will allow for quick adjustments if needed. Once the layout has been completed, panels should be screwed down with 10 screws (per full panel) as recommended.
7. Fill in any small areas that do not have panels with ½" plywood.
8. When installing the tubing, use staples or U-shaped tube fasteners to hold the tubing down in the area in front of the manifold.
9. Once the tubing has been connected to the manifold and the system has been pressure tested, fill in the square area in front of the manifold using ½" plywood (trimmed to fit) or a cement product that is screed to a level surface. A combination is also possible. Fill the larger spaces with ½" plywood pieces and smaller areas with a thinset product. The type of finished flooring will dictate what method is used.

Piping layout when tubing is run above the floor

The Quik Trak™ layout must be carefully planned before installation begins. A well-planned layout will result in equal loop lengths and minimal waste. Placement of the manifold is key to determining the layout. Manifolds can be placed either above or below the floor. Either location needs to be accessible by a service panel if the wall or ceiling below are finished.

Figures 1A and **1B** show manifold location in the wall because the floor is inaccessible from below (e.g., over a concrete slab).

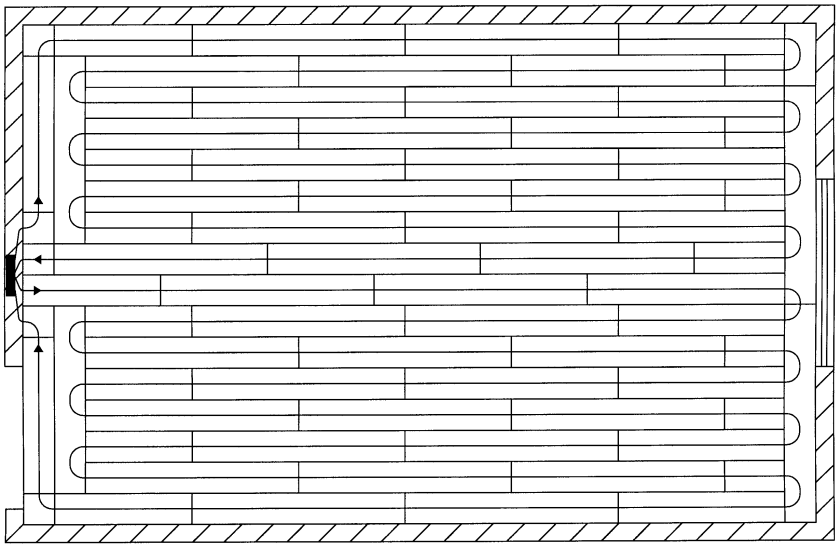


Figure 1A

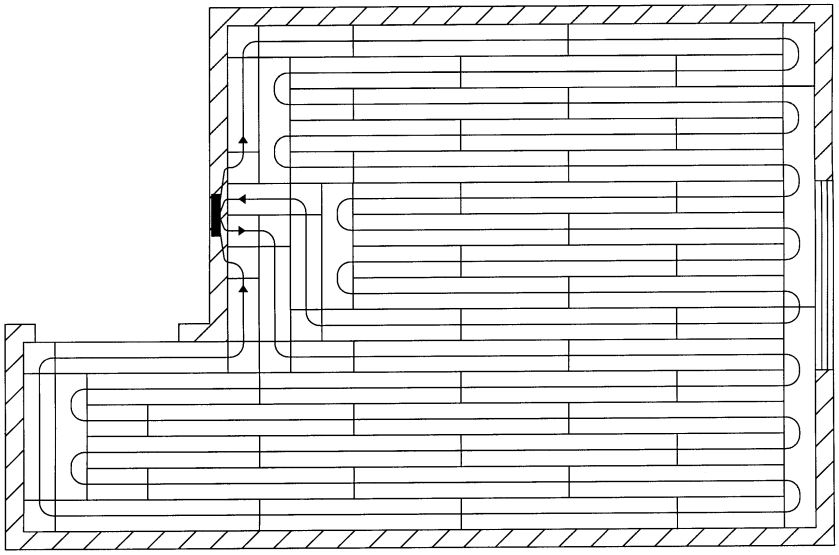


Figure 1B

Piping layout with access from below the floor

Figures 2A and **2B** show manifold locations in the joist cavity. The entire floor area is accessible.

The arrows illustrate the direction of water flow through the tubing. The dotted lines represent the supply and return lines that are beneath the floor.

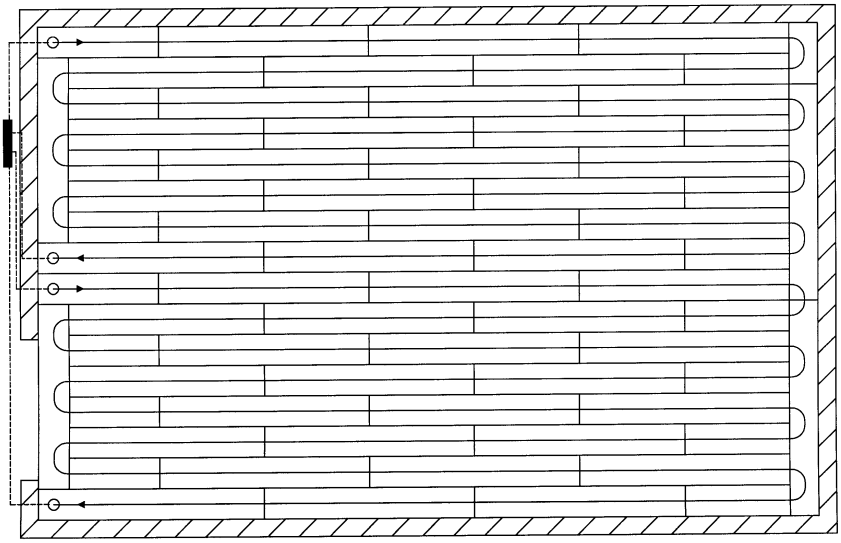


Figure 2A

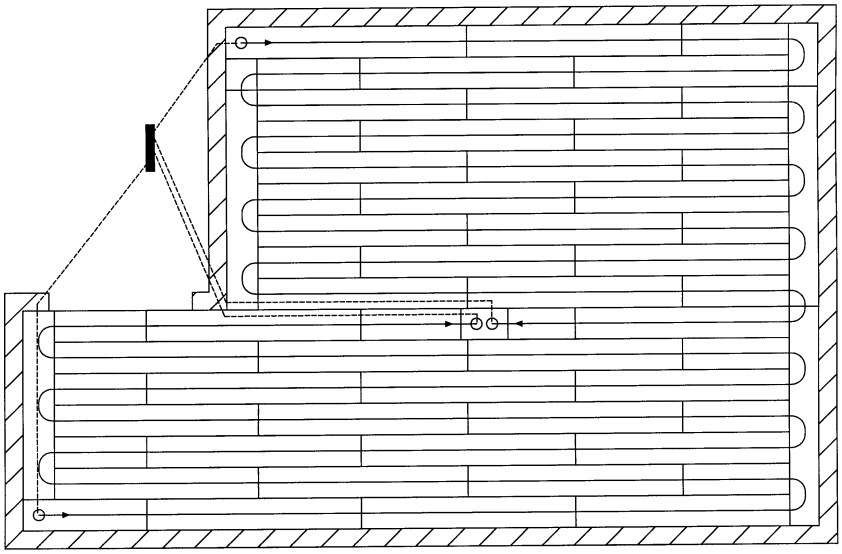


Figure 2B

Panel Direction

When possible, start with the warmest water on the exterior walls and progress toward the interior of the room. The direction of the panels in the layout dictate the tubing runs.

Figures 3A, 3B and **3C** show the recommended layout for the panels. The arrows represent the recommended direction of the Quik Trak™ panels.

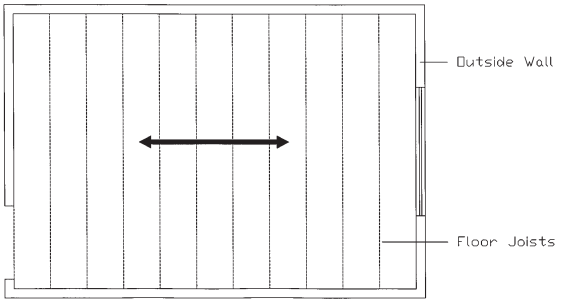


Figure 3A

For tile, parquet and linoleum finished floors, Quik Trak™ panels should be installed perpendicular to the floor joists. This will add strength to the floor and help prevent deflection of the floor.

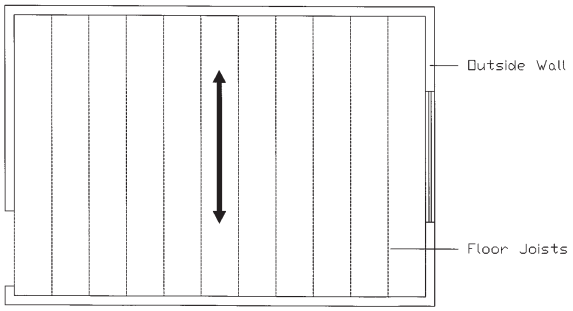


Figure 3B

For carpeted floors, Quik Trak™ panels should be installed parallel to the exterior wall to allow the warmest water to reach the coldest area first.

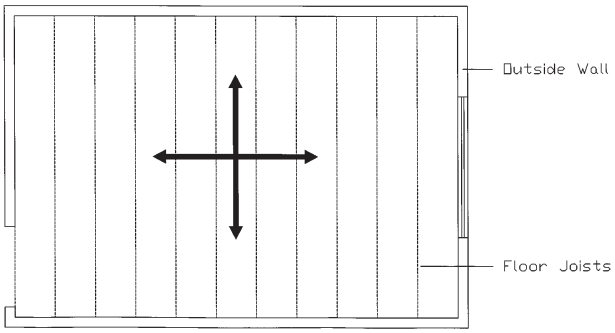


Figure 3C

For a wood finished floor covering, Quik Trak™ panels should be installed perpendicular to the direction of the finished wood floor boards.

Preliminary Layout

Once the direction of the Quik Trak™ panels is determined, a layout must be designed.

1. Mark any areas where panels will not be installed (e.g., kitchen cabinets).
2. From the wall, measure the width of the Return Trak™ plus ¼" for a total of 7¼" (see distance A).
3. Snap a chalk line to outline each of the Return Trak walls (see **Figure 4**).
4. Determine the starting point for the supply panel and snap a chalk line perpendicular to the other chalk lines using a square as a guide.

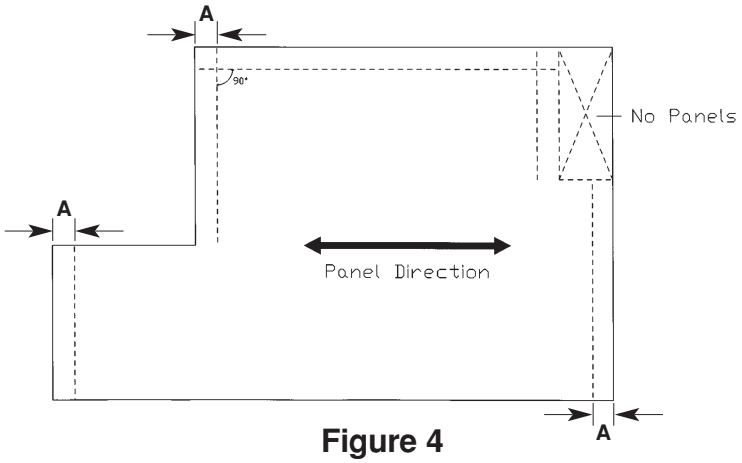


Figure 4

Note: For accurate results, use a square instead of the wall as a guide.

Panel Installation

1. Use a circular, power miter or table saw with a carbide blade for cutting Quik Trak™ panels.
2. Begin by laying the first row of panels parallel to the chalk line.
3. To improve structural integrity, stagger the panels in each row so the seams are not lined up next to each other. If you have to cut the last panel in the first row, you can use the other cut piece to start the second row. As an alternative, you may cut a panel in half and begin the second row. Continue this staggered pattern throughout the installation (see **Figure 5**).

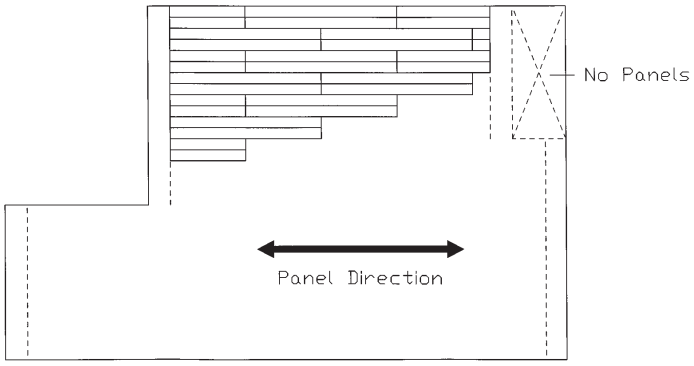


Figure 5

Note: *If the finished floor is hardwood, installation of a vapor barrier below the panels may be necessary. Check with the wood floor installer or manufacturer to determine the proper location and type of vapor barrier needed with their product.*

Panel Installation (cont.)

Begin the installation by laying down the Quik Trak™ panels and anchoring one side of a panel with a screw at both ends (see **Figure 6A**). This allows for quick realignment, if necessary. Once the panels are properly placed, screws should be installed on both sides of a panel. Ten screws must be used to ensure that the panels are secure (see **Figure 6B**). Use of the Quik Drive™ tool (E6050000) will speed this process and alleviate strain from bending.

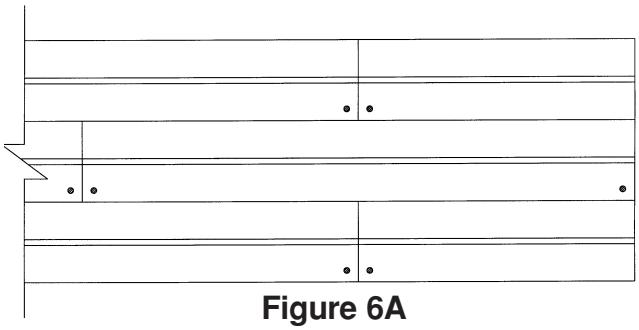


Figure 6A

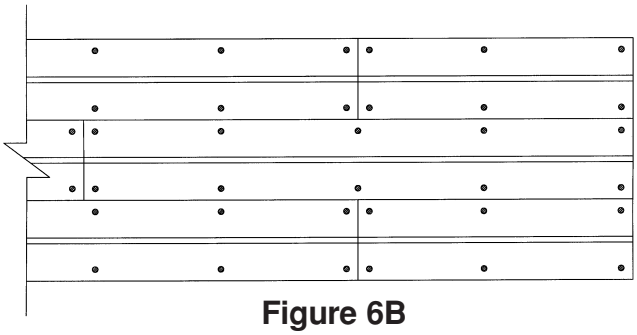
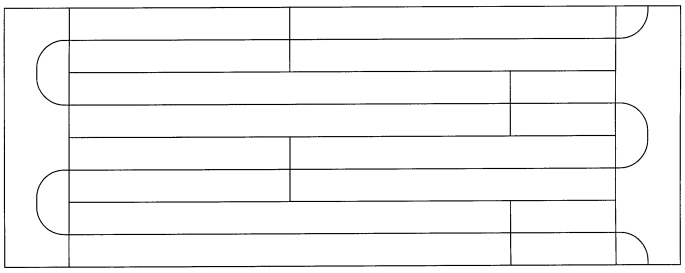


Figure 6B

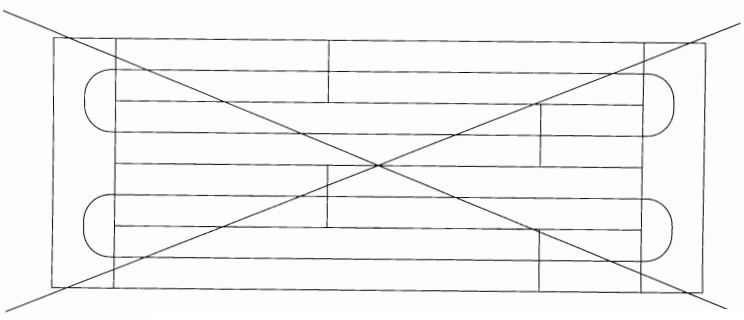
Installing Return Trak™ Panels

When the Quik Trak™ installation is finished, it is time to install the Return Trak™ panels.

1. Place the aluminum strips in the area where the Return Trak™ Panels will be installed.
2. Trim the aluminum strips with a pair of tin snips as needed.
3. Place the Return Trak™ panels so that they align with the grooves in the Quik Trak™ panels. Make sure to maintain a serpentine pattern for proper tubing placement (see **Figures 7A** and **7B**).
4. Secure the Return Trak™ panels into place using 10 screws. If necessary, Return Trak™ panels can be cut to provide 90° bends.
5. When Return Trak™ panels are in place, secure the half moon wood pieces with a single screw to guide tubing turns.



Correct - Figure 7A



Incorrect - Figure 7B

Final Floor Preparation

Use ½" plywood or similar product to fill any small areas not covered by panels (see **Figure 8**). This will make for a completely level surface. When installing panels on a suspended wood floor with access from below, determine the locations of the supply and return holes to the manifolds (see **Figure 2A** & **2B** on page 14).

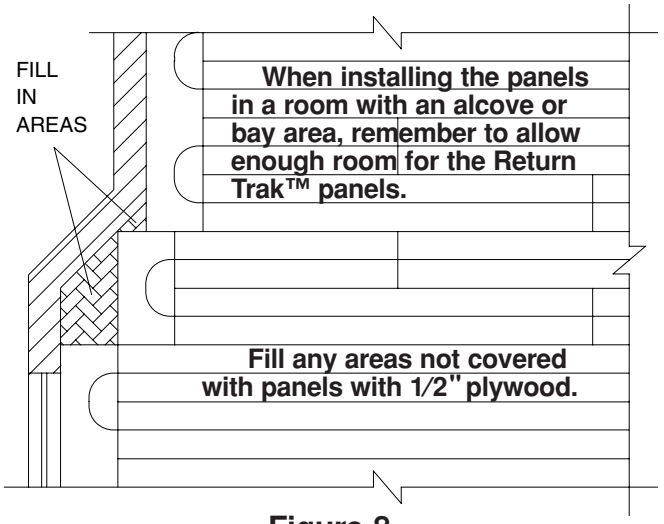


Figure 8

Note: *Leader length is crucial when calculating the number of loops for a given room. When calculating the amount of tubing that is required, remember to add the distance for the leaders length to and from the manifolds. Refer to the example given on page 2 of this manual. Also refer to* ***Figures 2A & 2B*** *on page 14.*

Tubing Installation

When the manifold location is below the subfloor, each supply and return run requires a ⅜" metal bend support to ensure tubing alignment through the subfloor. To compensate for the bend in the support, you must create a rectangular slot in the subfloor.

First, use the ⅝" drill bit and drill two holes side by side (see **Figure 9**). Then, use a sharp wood chisel to square off the hole. Trim ½" of the aluminum backing out of the groove. This will allow the ⅜" Metal Bend Support (A5110375) to be flush with the top of the panels (see **Figure 10**).

Next, vacuum the groove to remove all debris. Begin the tubing installation by attaching the supply side to the manifold using the ⅝" Quik Trak™ Fitting Assembly (A4020313). If the leader comes from under the floor, feed the loop through the floor and attach to the supply manifold.

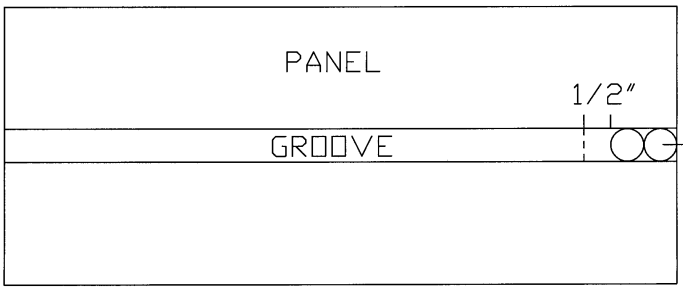


Figure 9

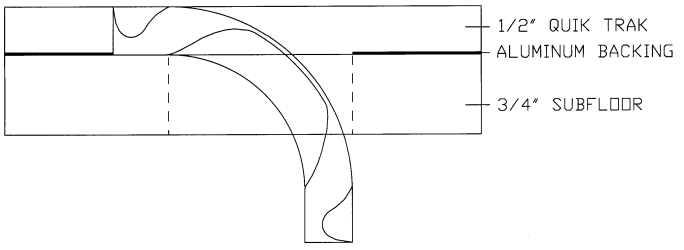


Figure 10

Tubing Installation (cont.)

Once the tubing is attached to the supply manifold, secure the ⅜" Metal Bend Support (A5110375) to the tube where it comes out of the floor from the supply manifold. It is best to first secure the bend support on the side of the tubing that will remain below the floor. Then position the bend support at the desired point on the tubing and snap the tubing into place. Finally, push the metal bend support into the hole that you drilled in the Quik Trak™ groove.

The tubing is now attached to the supply manifold and is through the subfloor. Next, lay down a (⅛") bead of Quik Trak™ Sealant (see **Figure 11A**). Since the sealant will become tacky in 8 to 10 minutes, it is recommended that silicone is applied to a section that can be covered with tubing in this amount of time. Next walk the tubing into the groove. Hard soled boots or shoes are recommended (see **Figure 11B**).

If the tubing does not snap completely into the groove, first check to see if there is some obstruction under the tube. If not, use a rubber mallet or the rubber coated base of a hammer to tap the tubing into place.

Repeat the process of applying the silicone and walking the tubing into the groove until you are a few feet from the pre-drilled hole for the run back to the return manifold. Slide the tubing through the hole and install a ⅜" Metal Bend Support as outlined on page 18 (see **Figure 10**). Finish by connecting the tubing to the return manifold. Repeat this procedure for any additional loops on the manifold.

Once you are finished with all the loops to a specific manifold, pressure test the system to a minimum of 60 psi for a minimum of 24 hours or to local code requirements. After the system has been pressure tested and inspected, the finished floor can be installed.

Figure 11A

Figure 11B

7" & 10" Radiant Floor/Ceiling Surface Temperature Charts

RADIANT FLOOR
SURFACE TEMPERATURES

ROOM SET-POINT	10	15	20	25	30	35	40	45	50	55
75°F	80.0	82.5	85.0	87.5	90.0	92.5	95.0	97.5	100.0	102.5
72°F	77.0	79.5	82.0	84.5	87.0	89.5	92.0	94.5	97.0	99.5
70°F	75.0	77.5	80.0	82.5	85.0	87.5	90.0	92.5	95.0	97.5
68°F	73.0	75.5	78.0	80.5	83.0	85.5	88.0	90.5	93.0	95.5
65°F	70.0	72.5	75.0	77.5	80.0	82.5	85.0	87.5	90.0	92.5
60°F	65.0	67.5	70.0	72.5	75.0	77.5	80.0	82.5	85.0	87.5

Btu/h/SQUARE FOOT

Exceeds the maximum recommended surface temperature for hardwood floors.

Exceeds the maximum recommended surface temperature for all floors.

RADIANT CEILING / RADIANT WALL
SURFACE TEMPERATURES

ROOM SET-POINT	10	15	20	25	30	35	40	45	50	55
75°F	81.0	84.0	88.0	91.0	94.0	97.0	100.0	103.0	106.0	109.0
72°F	78.0	81.0	85.0	88.0	91.0	94.0	97.0	100.0	103.0	106.0
70°F	76.0	79.0	83.0	86.0	89.0	92.0	95.0	98.0	101.0	104.0
68°F	74.0	77.0	81.0	84.0	87.0	90.0	93.0	96.0	99.0	102.0
65°F	71.0	74.0	78.0	81.0	84.0	87.0	90.0	93.0	96.0	99.0
60°F	66.0	69.0	73.0	76.0	79.0	82.0	85.0	88.0	91.0	94.0

Btu/h/SQUARE FOOT

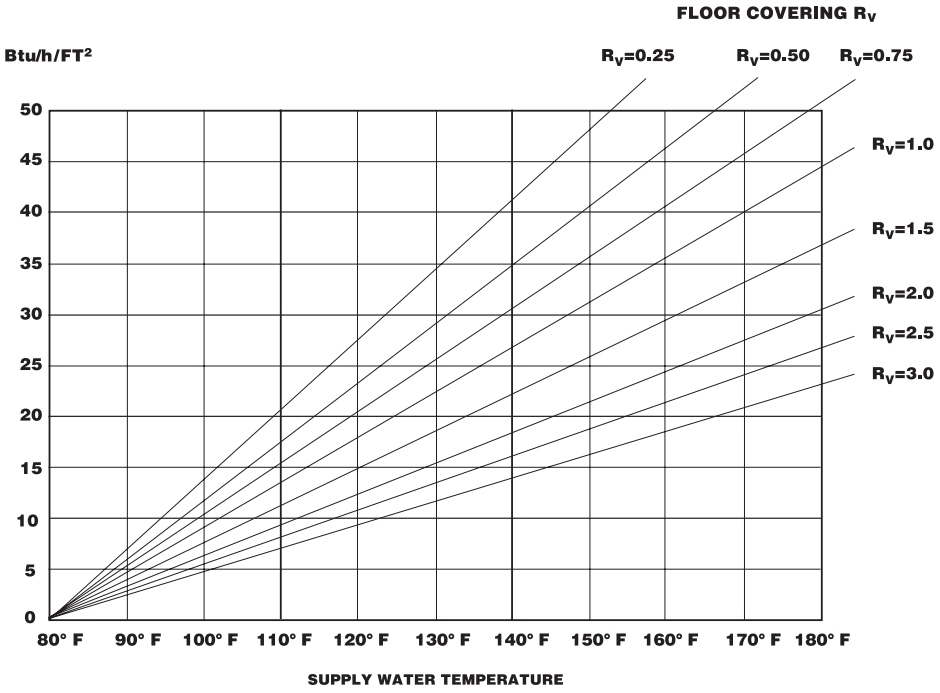
Exceeds the maximum recommended surface temperature for 8' ceilings. Maximum is 110° F for ceilings 9' -12'.

Floor Covering R-Value Chart

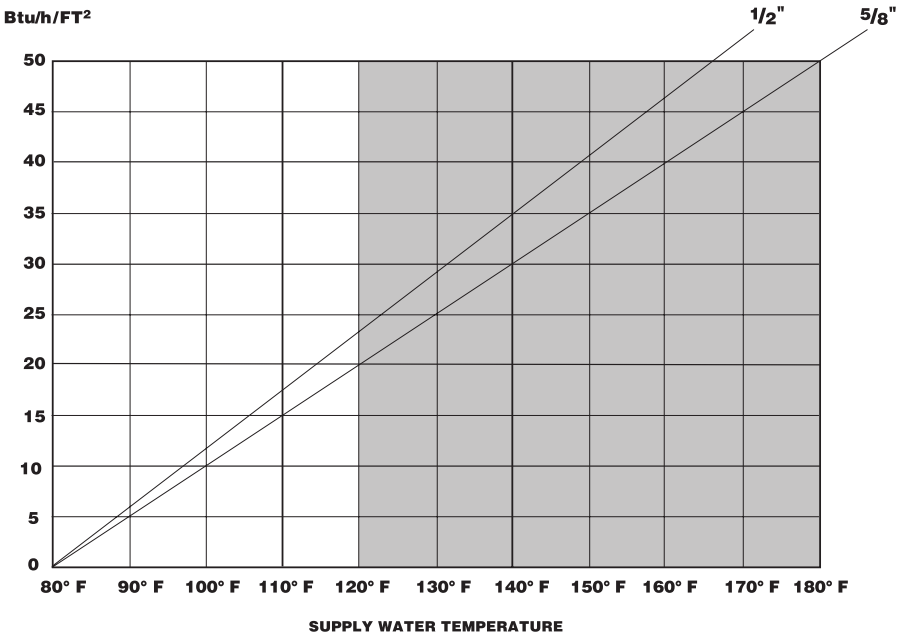
	FLOOR COVERING R-VALUES						
FLOOR COVERINGS	**1/8"**	**1/4"**	**3/8"**	**1/2"**	**5/8"**	**3/4"**	**1"**
Bare Floor	0.0	-	-	-	-	-	-
Plywood (medium or high density)	-	-	0.3	0.5	0.7	0.9	1.1
Sheet goods							
Vinyl	0.2	-	-	-	-	-	-
Linoleum (uninsulated)	0.2	-	-	-	-	-	-
Linoleum (insulated)	-	0.4	-	-	-	-	-
Cork	-	0.3	-	0.6	-	0.9	1.2
Tiles and Stones (w/thinset base)							
Ceramic Tile	-	0.3	-	0.5	-	0.8	1.0
Limestone	-	-	-	0.5	-	0.8	1.0
Stone (quarried)	-	-	-	0.4	-	-	0.8
Marble	-	0.2	-	0.4	-	-	0.8
Brick	-	-	-	-	-	-	1.0
Carpet and Pads							
Commercial Glue Down	-	0.6	0.8	-	-	-	-
Level Loop	-	-	1.5	2.0	2.5	**NR**	**NR**
Plush	-	-	0.4	0.8	1.2	1.6	2.4
Shag	-	-	0.8	1.0	1.6	2.4	**NR**
Saxony	-	-	1.3	1.7	2.2	**NR**	**NR**
Wool	-	-	2.5	**NR**	**NR**	**NR**	**NR**
Rubber (solid)	0.3	0.6	0.9	1.2	**NR**	**NR**	**NR**
Rubber (waffled)	0.2	0.4	0.6	0.8	1.0	**NR**	**NR**
Felt	1.0	1.5	**NR**	**NR**	**NR**	**NR**	**NR**
Hair and Jute	-	1.0	1.5	**NR**	**NR**	**NR**	**NR**
Prime Urethane	-	1.0	1.5	2.0	**NR**	**NR**	**NR**
Ultra Prime Urethane	-	-	0.7	-	-	-	-
Bonded Urethane	-	-	1.5	**NR**	**NR**	**NR**	**NR**
Wood Flooring							
Hardwoods							
Ash	-	-	0.4	0.5	0.6	0.8	1.0
Cherry	-	-	0.3	0.4	0.5	0.6	0.8
Elm	-	-	0.4	0.5	0.6	0.8	1.0
Mahogany	-	-	0.3	0.3	0.4	0.5	0.7
Maple	-	-	0.4	0.5	0.6	0.8	1.0
Oak	-	-	0.3	0.4	0.5	0.6	0.8
Walnut	-	-	0.3	0.4	0.5	0.6	0.8
Softwoods							
Fir	-	-	0.4	0.6	0.7	0.9	1.2
Pine	-	-	0.5	0.7	0.8	1.0	1.3
Spruce	-	-	0.5	0.7	0.8	1.0	1.3
Wood Flooring Pad	0.2	0.4	-	-	-	-	-

NR: Not recommended due to the high R-Value of the specific thickness.
All data is from the National Flooring Institute's 1990 study or ASHRAE thermoconductivity values.

7" Quik Trak™ Water Temperature Charts



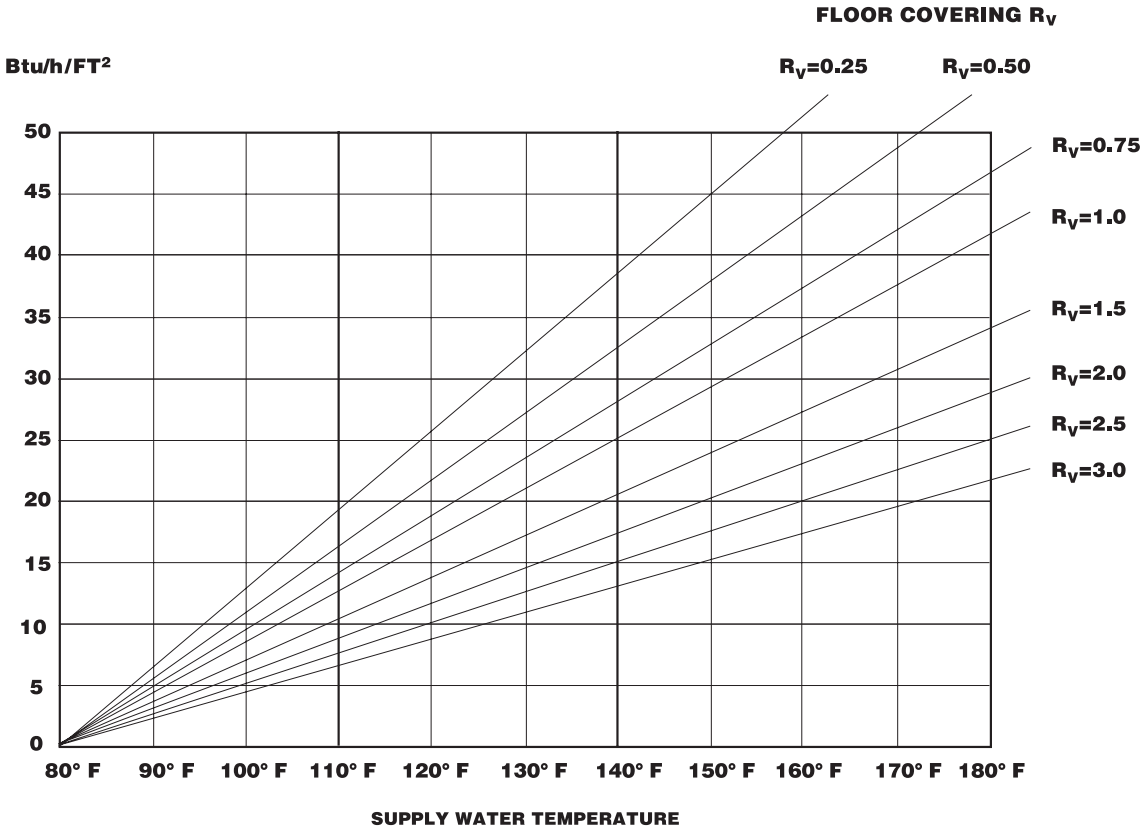
7" Quik Trak™ Radiant Floor



NOTES: 1) CHART LINES REPRESENT 1/2" AND 5/8" SHEETROCK
2) DO NOT EXCEED 120° F SUPPLY WATER TEMP. UNDER GYPSUM SHEETROCK

7" Quik Trak™ Radiant Wall/Ceiling

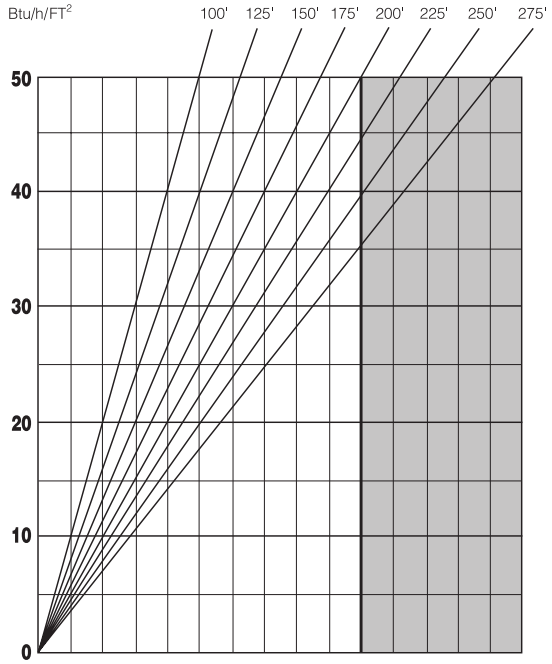
10" Quik Trak™ Water Temperature Chart



10" Quik Trak™ Radiant Floor

Quik Trak™ Flow Charts

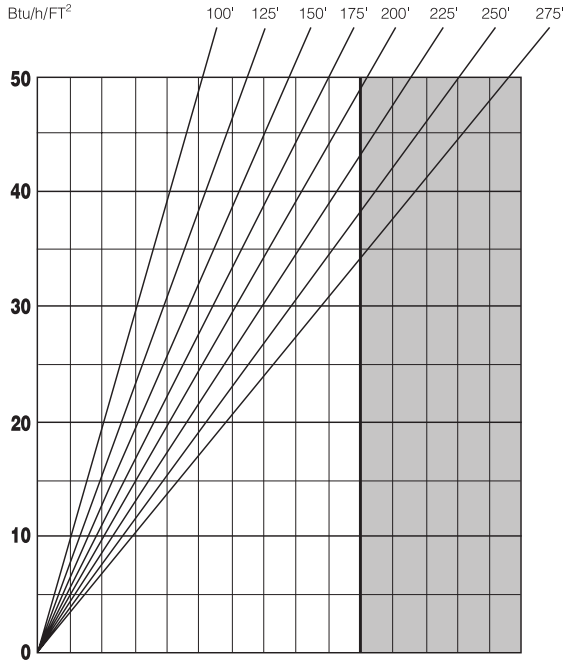
FLOW CHART
100% H_20
20°F SUPPLY/RETURN DIFFERENTIAL



7" O.C.	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60	.66	.72	.78	.84	.90
10" O.C.	.08	.17	.25	.33	.42	.50	.58	.67	.75	.83	.92	1.00	1.08	1.17	1.25

GPM

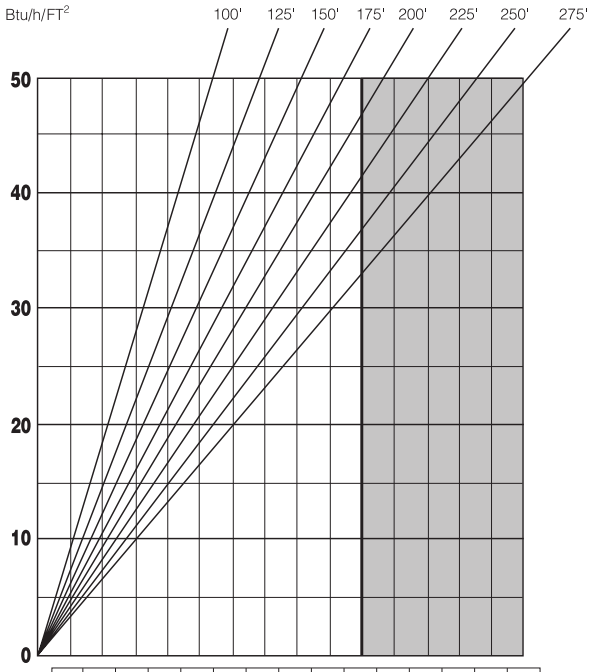
FLOW CHART
30% Glycol H_20 Mixture
20°F SUPPLY/RETURN DIFFERENTIAL



7" O.C.	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60	.66	.72	.78	.84	.90
10" O.C.	.08	.17	.25	.33	.42	.50	.58	.67	.75	.83	.92	1.00	1.08	1.17	1.25

GPM

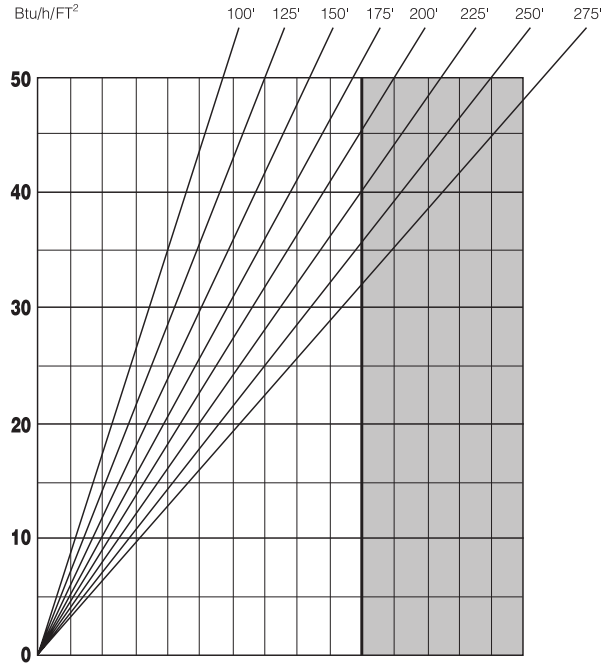
FLOW CHART
40% Glycol H_20 Mixture
20°F SUPPLY/RETURN DIFFERENTIAL



7" O.C.	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60	.66	.72	.78	.84	.90
10" O.C.	.08	.17	.25	.33	.42	.50	.58	.67	.75	.83	.92	1.00	1.08	1.17	1.25

GPM

FLOW CHART
50% Glycol H_20 Mixture
20°F SUPPLY/RETURN DIFFERENTIAL



7" O.C.	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60	.66	.72	.78	.84	.90
10" O.C.	.08	.17	.25	.33	.42	.50	.58	.67	.75	.83	.92	1.00	1.08	1.17	1.25

GPM

Note: Shaded areas represent theoretical design limits.

PEX Pressure Loss Charts

PRESSURE LOSS PER FOOT 5/16" PEX 100% Water

WIRSBO®	Head (Feet of Water) Per Foot of Pipe					
FLOW GALLONS PER MINUTE	80°F	100°F	120°F	140°F	160°F	180°F
.1	0.0072	0.0068	0.0065	0.0063	0.0061	0.0060
.2	0.0248	0.0234	0.0223	0.0215	0.0210	0.0205
.3	0.0510	0.0483	0.0461	0.0445	0.0433	0.0424
.4	0.0853	0.0807	0.0770	0.0744	0.0725	0.0710
.5	0.1271	0.1203	0.1148	0.1109	0.1081	0.1059
.6	0.1761	0.1667	0.1592	0.1537	0.1499	0.1468

PRESSURE LOSS PER FOOT 5/16" PEX 30% Glycol

WIRSBO®	Head (Feet of Water) Per Foot of Pipe					
FLOW GALLONS PER MINUTE	80°F	100°F	120°F	140°F	160°F	180°F
.1	0.0090	0.0085	0.0078	0.0075	0.0071	0.0068
.2	0.0309	0.0292	0.0269	0.0257	0.0244	0.0235
.3	0.0635	0.0601	0.0555	0.0530	0.0503	0.0485
.4	0.1061	0.1004	0.0927	0.0886	0.0840	0.0811
.5	0.1579	0.1495	0.1381	0.1320	0.1252	0.1209
.6	0.2186	0.2071	0.1913	0.1829	0.1735	0.1676

PRESSURE LOSS PER FOOT 5/16" PEX 40% Glycol

WIRSBO®	Head (Feet of Water) Per Foot of Pipe					
FLOW GALLONS PER MINUTE	80°F	100°F	120°F	140°F	160°F	180°F
.1	0.0100	0.0092	0.0086	0.0080	0.0076	0.0072
.2	0.0340	0.0317	0.0296	0.0276	0.0260	0.0246
.3	0.0700	0.0651	0.0608	0.0568	0.0530	0.0508
.4	0.1160	0.1088	0.1016	0.0949	0.0890	0.0848
.5	0.1730	0.1619	0.1513	0.1413	0.1330	0.1264
.6	0.2400	0.2241	0.2094	0.1957	0.1840	0.1751

PRESSURE LOSS PER FOOT 5/16" PEX 50% Glycol

WIRSBO®	Head (Feet of Water) Per Foot of Pipe					
FLOW GALLONS PER MINUTE	80°F	100°F	120°F	140°F	160°F	180°F
.1	0.0109	0.0097	0.0089	0.0084	0.0079	0.0076
.2	0.0375	0.0334	0.0307	0.0287	0.0272	0.0261
.3	0.0770	0.0687	0.0632	0.0591	0.0561	0.0538
.4	0.1285	0.1146	0.1055	0.0987	0.0938	0.0899
.5	0.1911	0.1706	0.1570	0.1470	0.1396	0.1339
.6	0.2644	0.2361	0.2174	0.2036	0.1934	0.1854

Quik Trak™ Notes

If you need additional assistance or information on Quik Trak™ systems, please contact Wirsbo's Technical Services Department at 1-800-321-4739.

For more information about radiant floor heating systems including installation methods, wiring diagrams, control strategies and product information consult the Wirsbo Complete Design Assistance Manual (CDAM).

.125" = 1 ft (1 square = 1 sq. ft.)

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Wirsbo products can only be purchased through your local wholesale distributor.

Uponor Wirsbo
5925 148th STREET WEST
APPLE VALLEY, MN 55124

TEL: (800) 321-4739
FAX: (952) 891-1409
www.wirsbo.com

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