

# RAZ Panel™

## Installation Training



- The RAZ Panel™ modular board system from EZ Floor, LLC is an easily installed vapor barrier, insulation board and PEX tube holder all in one. This product allows for simple installation of hydronic radiant floor heating systems that today consist of primarily garages, basements and slab-on-grade installations where concrete is used.

# PROPERTIES

- The RAZ Panel™ is 2 7/8” thick overall with a solid 2” of expandable polystyrene (EPS) foam providing a thermal resistance or R rating of 11.9.
- The compressive strength of the foam is 860 pounds per square foot.
- The thermoformed film has a perm rating of .56 perms.

# Terminology

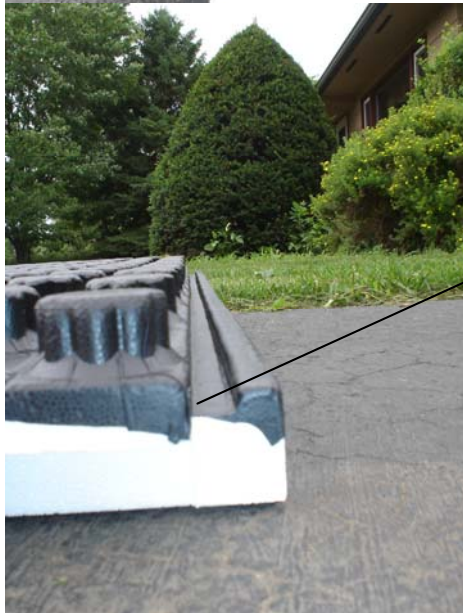


- Knob: The high spot on the panel that holds the PEX tubing in place.
- Flat: Those areas on the top of the panel that have no knob

# Terminology Continued



- Tongue: That part of the panel that overlaps and interlocks with the groove.



- Groove: That part of the panel that receives the tongue.

# PEX Tubing

- The current model of RAZ Panel™, part number RAZ 100278 will accommodate both 1/2" and 5/8" PEX tubing.
- Future models will vary in thickness as well as the diameter of the PEX they can hold.

# Technical Specifications

- All testing was done by Warnok-Hersey's ETL Semko. ETL Semko is an independent laboratory that performs product testing in North America and Europe.

The **RAZ Panel** insulated floor panel system from EZ Floor, LLC is insulation, vapor barrier and tube fastener all in one. Easy, three-step installation means you could save up 66% of the insulation cost on energy-efficient in-floor radiant heat! For more information, contact your area EZ Floor representative or visit us on the web!

2" grid for 1/2 inch pipe (5/8 O.D.)

Board Size	25"x49
Effective Area	24"x48
Nominal Thickness of Insulation	2"
Total Thickness	2 7/8'
Standard Color	Varies
Thermal Resistance* (ASTM C518-04)	R-11.5
Compressive Resistance* (ASTM C165-00)	860 ps
Perm Resistance* (ASTM E96-00)	.56 perms

*\*Tested by Intertek ETL Semko an independent testing lab*

# Installation Basics

- Although not imperative, attending an installation training course on radiant heating is a good idea. There are some fantastic products out there today and by attending a training session you get to learn about them as well as how to do the best job possible for the all-important customer. Some states require certification for installers, so why not get the jump on your competition?



# RAZ Panel™ Installation

- First things first, estimating the number of panels required for the job.
- Simply multiply length times width of the structure, say it's 40 X 80 which equals 3200 square feet.
- As the panels are 8 square feet, divide the 3200 by 8 and you get 400 panels required for the job.
- Panels come in bundles of 18. You must further divide to determine the number of bundles. Such as  $400 / 18 = 22.22$  bundles. Round up to the nearest whole bundle or in this case 23 bundles.

# Fill Material

- There are many different materials used as fill in sub-slab radiant heat applications. Crushed limestone, sand and gravel are just a few. Although any material commonly used will work with the panels, sand seems to be the easiest to level.

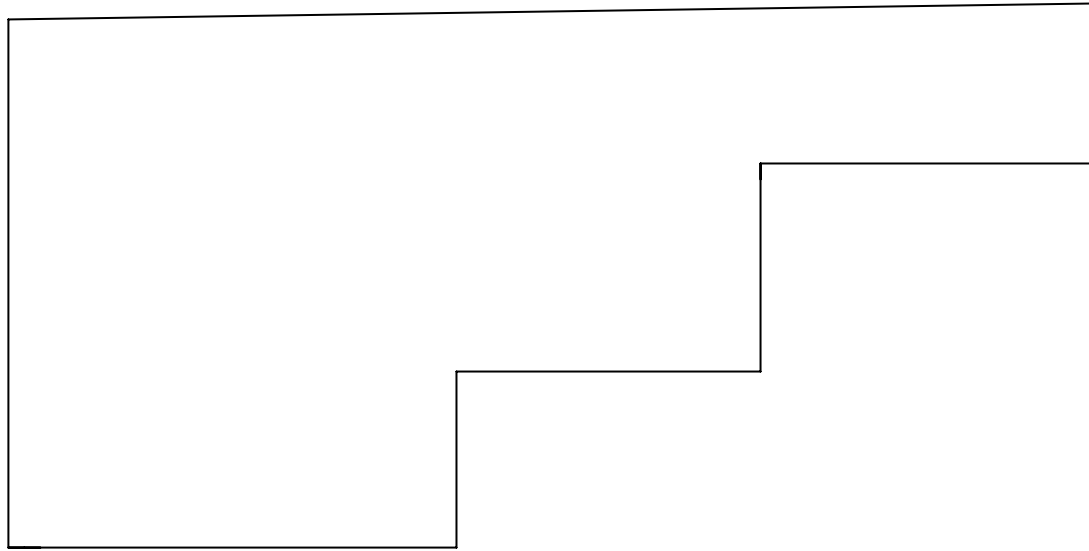
# Leveling

- Fill material should be leveled as close to  $\pm 1/4$ " as is reasonable. One of the benefits of using the panel is that the 2' x 4' panels will float independently of the surrounding panels thereby eliminating broken foam boards and trip hazards. You can also level as you go if you feel comfortable with the beginning grade of your fill material.

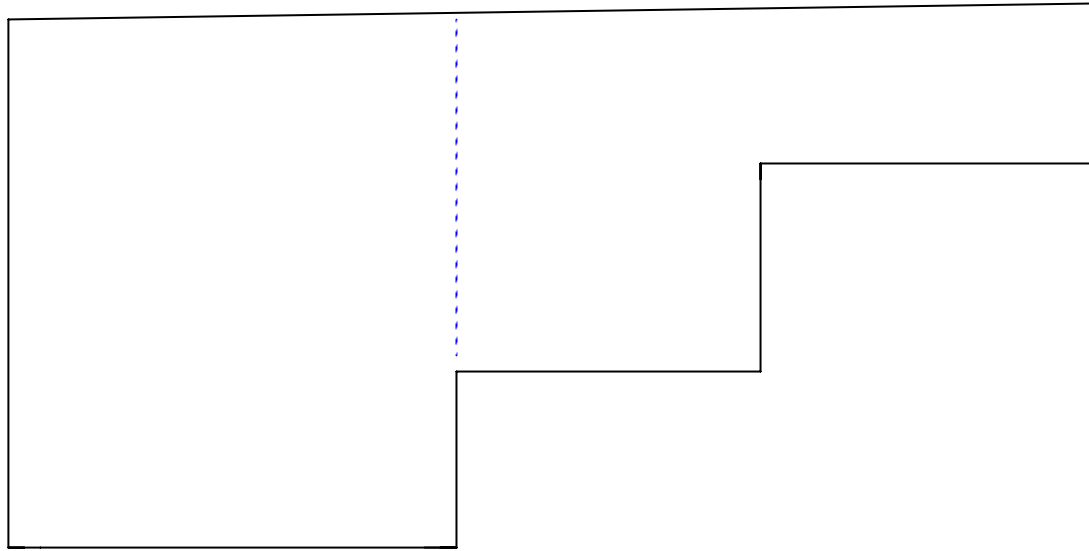
# Determining the Layout

- Rectangular structures offer no real challenges in determining which direction you will work in laying the panels. If one of the dimensions is evenly divisible two or four, work along that dimension.
- Structures with irregular exterior walls will require you to think a little about how best to proceed.

The below basement plan takes a little thought about how to proceed. Assuming the top of the drawing is North, take a few minutes to think about which is the best direction to lay the panels. Keeping cuts to a minimum should be your primary concern. The west to east dimension is 40 feet. The north-south dimension is 25 feet.



The largest portion of the structure that can be divided into a perfect rectangle is the western half. It would be most efficient to start in the southwest corner working north from left to right. The cut end at the end of the first row will be used to begin the next row.



# Getting Started

- Using a box cutter or key hole saw, cut the tongue portion of the interlock off of the 4' dimension going along the west wall as well as the tongue portion that will butt up against the south wall.



- Doing this ensures that you get a tight fit next to the wall with a solid 2" of foam and eliminates any air gap.
- The grooves of the panels should always be at the bottom of the 4' dimension and to the right on the 2' dimension.



- Place the panel with the 4' length along the west wall and the cut end of the 2' length against the south wall.
- Successive panels to be placed in this row now only need the tongue along the 4' dimension trimmed.
- Place trimmed panels so that they interlock along the 2' dimension.

- Continue placing trimmed panels until you get to the north wall. You will most likely need to cut the final panel in this row to fit it in place.



# Cutting the panels

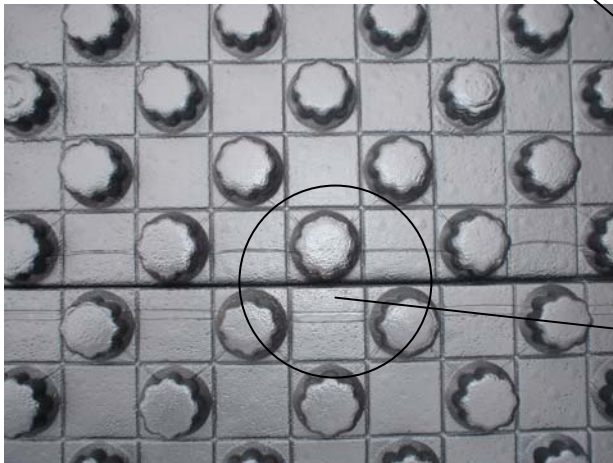
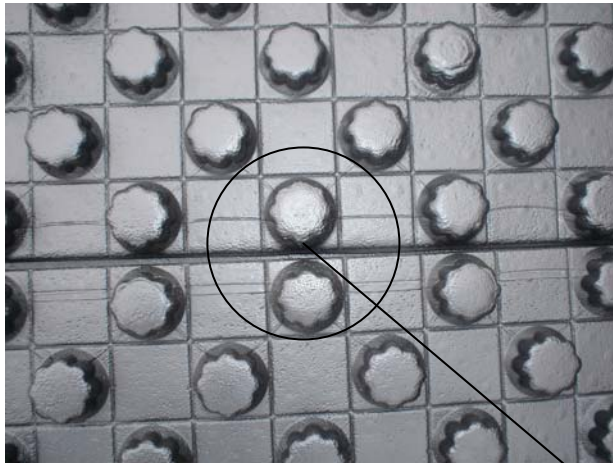
- Cutting full panels is very easy. Simply score the top of the panel at the length you want and then flip it foam side up and hit the panel on the ground and it will break along the score line. The smaller the panel piece the harder this becomes. This is when you will use your keyhole saw.



- The remainder of panels that were cut in the previous step can be used to begin the next row. If you are cutting a full panel to begin the row, the remainder will be used at the end of that row.



- The reason for the preceding step is two-fold. First, we want to make sure that we stagger the joints where panels come together to avoid common seams. Second, we want to minimize waste.



- NOTE: The panels are divided into 2" squares. Each square either contains a knob or a flat and they alternate every other square. When placing the first panel of a new row you must check to verify that from row to row, this alternating sequence of knob-flat-knob-flat is not interrupted. Otherwise it could cause difficulties when laying the PEX tube later on.

No

Yes

- If the flat-knob-flat sequence is interrupted when beginning a new row, simply cut two more inches of the panel off. This will get the sequence back in proper order.

- Now it is simply a matter of repeating these steps until you have installed the RAZ Panel™ throughout the entire area to be heated.



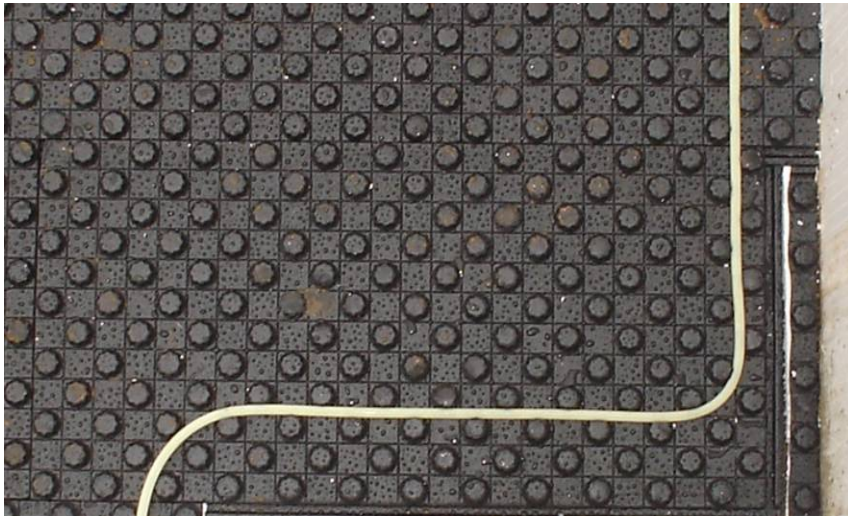


- It is not required but a good idea to, after each couple of rows, walk along the interlock area of the panels to ensure that the panels are locked together.

# Installing the PEX tubing

- At this point you can send the installation crew on to other jobs. Installing the PEX should be a one person job.
- It is highly recommended that you use a spool to hold the PEX tubing. Otherwise another person may still be required.





- The only tip about making the PEX installation easier is that when making a turn, ensure the PEX is fully seated in the knobs before beginning or continuing a run.

# PEX Installation, Cont'd



- Other than ensuring the PEX is securely in the panel when making a corner, installation is as simple as walking the tube into place.

# Spacing the PEX

- It is extremely easy to ensure that your runs are properly spaced. Simply count the number of knobs and flats and multiply by 2 to get your 6,8,10-inch or whatever distance centers.

- Of the very few negative responses I have received regarding this product, the one I find the most humorous is this one:

*“Contractors are too rough on product, I don’t think this can stand up to the handling and foot traffic.”*

- I hope the following photographs prove otherwise.



# Concrete Placement

- One of the many benefits of the RAZ Panel™ is that the PEX tubing is below the working surface of the foam. So if the installer is not the same person placing the concrete you don't have to worry about the crew walking on the panels during the pour. The tube isn't going to pop up nor is it going to be kicked out of place or rolled over with a wheelbarrow full of 'crete.



- Concrete is placed and finished the same as on any other job. Wire mesh and rebar can be laid directly on top of the panels if it is called for.

# Why Buy?

- Does the job of three items: the foam, the vapor barrier and the staples or zip ties.  
This means less items to estimate and remember to purchase and take to the job site or run out of towards the end of a job, day or week.
- Panels come in bundles of 16. Easy to move around the site and store. Bundles have a top and bottom cap to protect the panels during handling. No more getting blown around by the wind while handling 4' X 8' sheets and having to find a large rock to weigh them down.

# Why Buy, cont'd

- Competing “tarp” type products provide no R-value in a sub-slab environment due to compression by the concrete.
- Must buy and handle wire mesh and then bend over and zip tie PEX tubing to mesh or staple through your vapor barrier thereby degrading its effectiveness.
- 4' X 8' sheets are cumbersome to handle.
- Create trip hazard where sheets meet because they don't lay flat.
- Tube sits on top of sheet creating trip hazard and is susceptible to damage from foot or equipment traffic.

# Need more reasons to buy?

- Tremendous labor savings. One-person PEX installation frees up others for other jobs or to reduce overhead labor costs.
- PEX tube spacing is exactly on 2” increment centers. No more “close enough”
- No duct taping required
- Minimal waste
- Marked 2” increments make for ease of exact cutting.
- No more balky staplers to fail you

# And while we're at it

- NO-COST MISTAKES!

Talk about keeping the boss happy. With other methods an error in placing a run means damaged foam, wasted staples and a lot of wasted labor. With the RAZ Panel™ you simply pull the tube up, place it where you now need it and walk it back in. Minimal added labor costs and no damaged, unusable product or components!

- The RAZ Panel™ is very easy to use and strong. It reduces the inventory you have to purchase and carry making life easier for everyone involved with the project. Thank you for your interest and I look forward to working with you!