The Fundamentals of Electric Floor Heating
Electric Radiant Floor Heating

- Resistance cable that uses electricity to emit heat
- Adds minimal height to flooring surface
- Reduces allergens and dust when compared to forced-air
- Provides heat from floor to ceiling
Radiant heating falls under the “far infrared” wavelength between 9.5 & 10 μm.

Energy is converted to heat when it hits a solid object of a cooler temperature.

Heat retention and not heat absorption that creates feeling of warmth.
Sole Source Heat vs Comfort

- Sole-source heat provides enough BTU’s to heat a space to a sufficient comfort level

- A heat loss calculation should be done for every space in the house, especially larger areas

- Have room insulation information handy before doing your calculation at https://www.warmlyyours.com/tools/heatloss-calculator

- Calculation will yield number of BTU’s required to heat the space and help determine whether floor heating will provide enough BTU’s
Electric Floor Heating Products

<table>
<thead>
<tr>
<th>Slab Heating</th>
<th>Environ</th>
<th>TempZone</th>
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<tbody>
<tr>
<td>For use under indoor concrete</td>
<td>For use under carpet*, laminate</td>
<td>For underneath ceramic tile, natural stone,</td>
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<tr>
<td>floors (embedded within concrete)</td>
<td>and floating wood</td>
<td>hardwood, wood, and other popular flooring</td>
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<td>(*In the U.S. only)</td>
<td>materials</td>
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Mats vs Cable

- Cable can be spaced according to desired output of heat
- The wider the spacing, the lower the wattage per square foot
- TempZone Mats have 3” pre-spaced cable attached to a mesh backing
- Wet location listed
Insulating Heating Wires

- Concrete slabs are naturally cold and will absorb any heat.
- You will need to use insulating underlayments to direct the heat up through the floor.
- CeraZorb is especially useful in high moisture areas such as basements.
Embedded Heat

- Check installation instructions for acceptable radiant heat types

- If “embedded” heat is required, we quote our TempZone heating products EMBEDDED in 3/8” of self leveling underlayment

- See the video on our website which shows this process of heating a nailed-down hardwood floor
Again, check installation instructions for limitations of applying radiant heating.

Rigidity of flooring will help you determine if Environ will work underneath.

See our past webinar on our website which shows the process of heating a floating laminate floor.
SmartPlan

- All of our systems come with a customized SmartPlan with full installation instructions.

- When at the jobsite, always measure and verify dimensions before installing.

- Electrical specs of the system are included with the SmartPlan.

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**Heating Product:** TempZone Flex Roll 120V

**Wattage:** 15 W/Sq.ft.

**Breaker(s):** 1 x 15 Amp 120V Non-GFI Circuit

**Operating Cost:** $0.05/hour @ $0.11/kWh

**Total Amperage:** 8.1 Amps

**Total Wattage:** 967 Watts

**Control:** UDG4-4999

**Floor Load:** 1.0 kW*

* used during thermostat setup
Cross-Section of Cable

- Conductor Core
- Fluoropolymer Insulation
- Ground Shield
- Sheathing
Constant Wattage

- Same wattage per linear foot – consistent power output
- Not affected by environmental conditions, making it ideal for generating effective heat for many years
- All of our floor heating products as well as our Snow Melt systems are constant wattage cables
Ohms Law

- Demonstrates the relationship between voltage, amperage and a circuit’s resistance
- When voltage is applied to a resistant cable, it will create amperage
- Multiplying voltage by amperage creates wattage – Heat
- If the cable is shortened or lengthened, the resistance will change, resulting in a change in the watts per square foot
Why Can’t I Cut the Cable?

- Increases the wattage per square foot of the product, possibly leading to overheating.
- Product will no longer be under warranty and will not meet NEC code.
- Less resistance = more current (higher temperatures).
- More resistance = less current (lower temperatures).
240V is no more efficient than 120V

Using 240V lets one cover twice the square footage while still using one controller

Our thermostats can switch loads up to 15 amps in either 120 or 240 volts

If the heating element is 120V, the power supplied to the thermostat must be 120V
Adding a Power Module

- Our power modules can be hooked up to any of our thermostats to help provide additional power.

- Electrical output can be increased in 15 amp increments.

- Power modules are connected to each other and to the thermostat in a “daisy-chain” using low voltage thermostat wire.
When wiring a circuit, only 80% of that circuit rating can be used.

Our thermostats can switch up to 15 amps, but 14 amps of load cannot be placed on a 15 amp breaker.

For a 20 amp circuit, you could load only 16 amps.

For a 15 amp breaker, only 12 amps should be loaded.

Always comply with all local codes.
Operating Cost

- Adjusting the spacing can help control the electrical costs for a system

- We also offer an Operating Cost Calculator on our website

- Our tool shows you the hourly, daily and yearly electrical costs
Test when you receive the heating products

Test your system once you have your mats/cable laid out correctly

Test after you’ve finished installing your flooring
Repairing Floor Heating Cables

- Repairs can be done without ripping up the entire floor
- Specialized tools can identify any damaged areas in a floor heating system
- Splice repair kits are offered on our website
- Contact our Tech Support team for details on how to rent the tools you’d need
We’re here if you have any questions.

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Until next time,
Stay Warm and Be Radiant