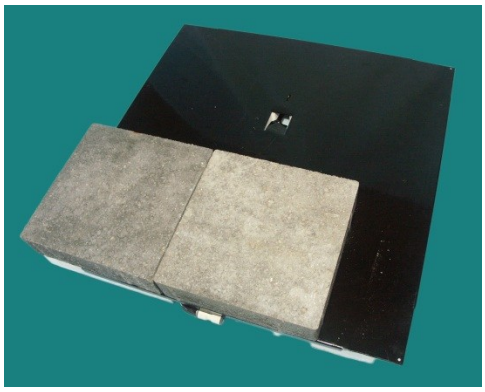
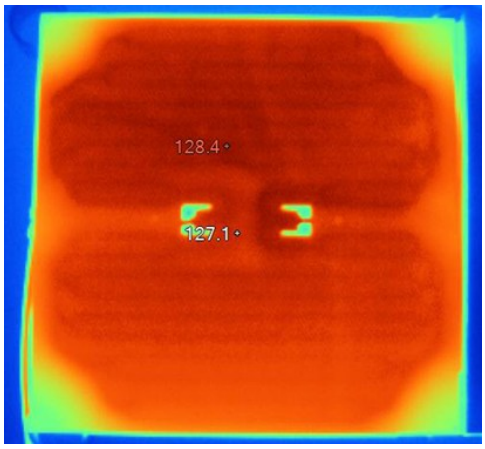
THERMA-HEXX LLC

ThermaPAVER® multifunctional thermal transfer system

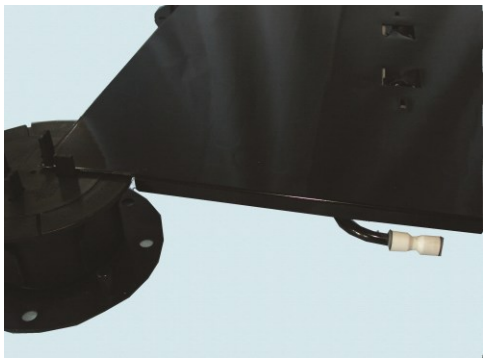
By Robert Barmore, CEO



Surface Mount Version



ThermaPAVER panel showing even heat distribution



Pedestal Mount Version

ThermaPAVER Introduction

ThermaPAVER converts a patio, plaza, rooftop, sidewalk or driveway into a solar collector surface invisibly. It cools the paver surface while heating domestic water or pool water.

ThermaPAVER is a modular heat exchanger that nests beneath pedestal mounted or surface mounted pavers. It removes solar generated heat from the paver into a glycol solution for heating domestic hot water or for heating swimming pools while cooling the paver surface at the same time. This makes the patio area more comfortable and usable. In cold climates, the process can be reversed for snowmelting of the paver surface using low temperature heat sources such as geothermal energy, waste energy or stored thermal energy ot conventional heat sources.

ThermaPAVER works with standard 2' x 2' pavers or stones in the pedestal mounted version. When used with the surface mounted version, any size paver or flagstone can be used. They can be used under sidewalks, plazas, patios or driveways.

System Options

- During hot weather, when used under a patio, plaza, sidewalk, rooftop patio or plaza the solar generated heat in the patio pavers or stones is absorbed into the underlying aluminum ThermaPAVER panel and subsequently into the closed loop glycol fluid held within the fractally designed channels in the panels. The fluid is continuously pumped through a heat exchanger that can be connected to a swimming pool circulation system and / or domestic hot water tank or large storage vessel. A geo-thermal ground loop can be used to dump excessive heat.
- During cold weather, the system can be used to snowmelt the surface. When used in conjunction with a

geo-thermal ground loop and a PV solar collector to run the pump, you will have a virtually cost free snowmelt system. The fluid in the ground loop is typically 50 degrees f. When pumped 24/7 in freezing weather, it keeps the pavers above freezing. Snow and ice will never have a chance to accumulate. For extremely cold situations, a boiler can be added to the loop to boost the temp when needed. This system is gentle on the pavers/stones as they are not going through temperature extremes as they would in a conventional snowmelt system.

- For pedestal mounted systems that are typically used on rooftop or plaza systems, we use 1 -1.5" EPS foam insulation backing. ThermaPAVER is the only way to cool the rooftop pavers while heating the domestic or pool water in the building / complex creating a comfortable area for entertaining, exercise, or lounging. The system also helps as a cool roof system lowering the urban heat island effect. This system is also the only way to snowmelt a pedestal mounted paver. They are to be used with 2' x 2' standard architectural pavers on any type of pedestal system. The rooftop system will also lower building A/C costs as the roof system will be much cooler.
- For ground or surface mounted systems, we have various options depending on the intended use. For pedestrian walkways and patios we use EPS foam backing insulation that is between 1 – 1.5" thick. For residential driveways or city sidewalks, we use 1.5" HD 60 XPS Dow Styrofoam. In the driveway version, the surface of the aluminum panel has a rubberized asphalt membrane applied on top to provide a grippy nonabrasive interface between the ThermaPAVER panel and the paver. This assures that the pavers will not shift on the panel from vehicle traffic and abrade the panel. Up to ½" of fine bedding sand can be applied under the paver to make paver setting easier.
- For sloped roofing, ThermaPAVER can be run in vertical rows at 2' on center. They would be covered with metal standing seam roofing.

System Design

The following questions need to be answered in order to design a system.

- Do you want to heat domestic water to the highest temp possible?
- Do you want solar tax credits for a domestic solar hot water system?
- Do you want to heat a swimming pool?
- Do you want to cool a patio?
- Do you want to heat a pool while cooling the patio?

- Do you want to first heat domestic water, then when that is satisfied, heat a pool then when that is satisfied, dump any excess heat to keep a cool patio?
- Do you want to cool a patio using a chiller?
- Do you want to snowmelt the surface?
- Do you want to snowmelt using low temp geo-thermal energy?
- Do you want to back up a geo-thermal snowmelt system with a boiler?
- Do you want to store thermal energy from hot months for use in cooler months?
- Will the system be pedestal or surface mounted?
- If pedestal mounted, how much vertical space is available for the send / return manifolds, panels and pavers? What type of pedestals will be used?
- If surface mounted, what is the substrate? What is the use and type of traffic?
- What color and type of paver / stone will be used?
- If used on a sloped roof, what is the roofing type?
- BTU's per sq. ft. will vary depending on system design, use and climate. A heat transfer rate of 75 Btu / sq. ft. / hr. is a good baseline.

System Costs

- All systems are custom designed.
- Installed system costs will vary due to the project's size and complexity.
- Payback can be calculated in a number of ways depending on the use and functionality of the system.

Value Added Benefits

In addition to direct financial savings due to thermal transfer efficiencies, added value is derived from the following factors:

- Comfortable, cool spaces; no more burned feet around pools from hot patio surfaces.
- Longer lasting paver surfaces due to the elimination of thermal shock from high temp snow melt systems.
- Longer lasting pavement surfaces due to the elimination of wear and tear from snowplowing.
- No snow mountains and loss of space from snow removal.
- Lowered building A/C costs when used on roofs.
- Roof membranes will last longer due to the cooler space above the roof.
- Reduction in the urban heat island effect.
- Potential LEED and cool roof points.
- Potential Solar tax credits.

Summary

ThermaPAVER is a versatile heat transfer solution for use in all climates.

ThermaPAVER is a value added heat exchange product that provides architects, landscapers, roofers, solar installers and builders with a new tool for creating more usable spaces, lowered utility costs, longer lasting building components all with a pay back.

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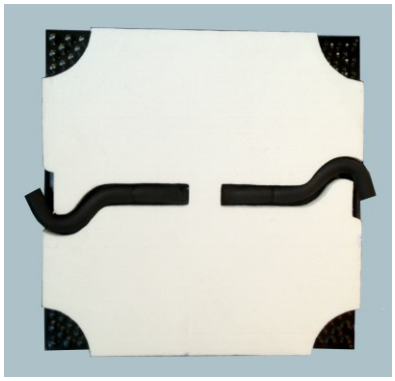
Industrial, government, commercial and residential building and property owners can benefit in numerous ways from the installation of ThermaPAVER.

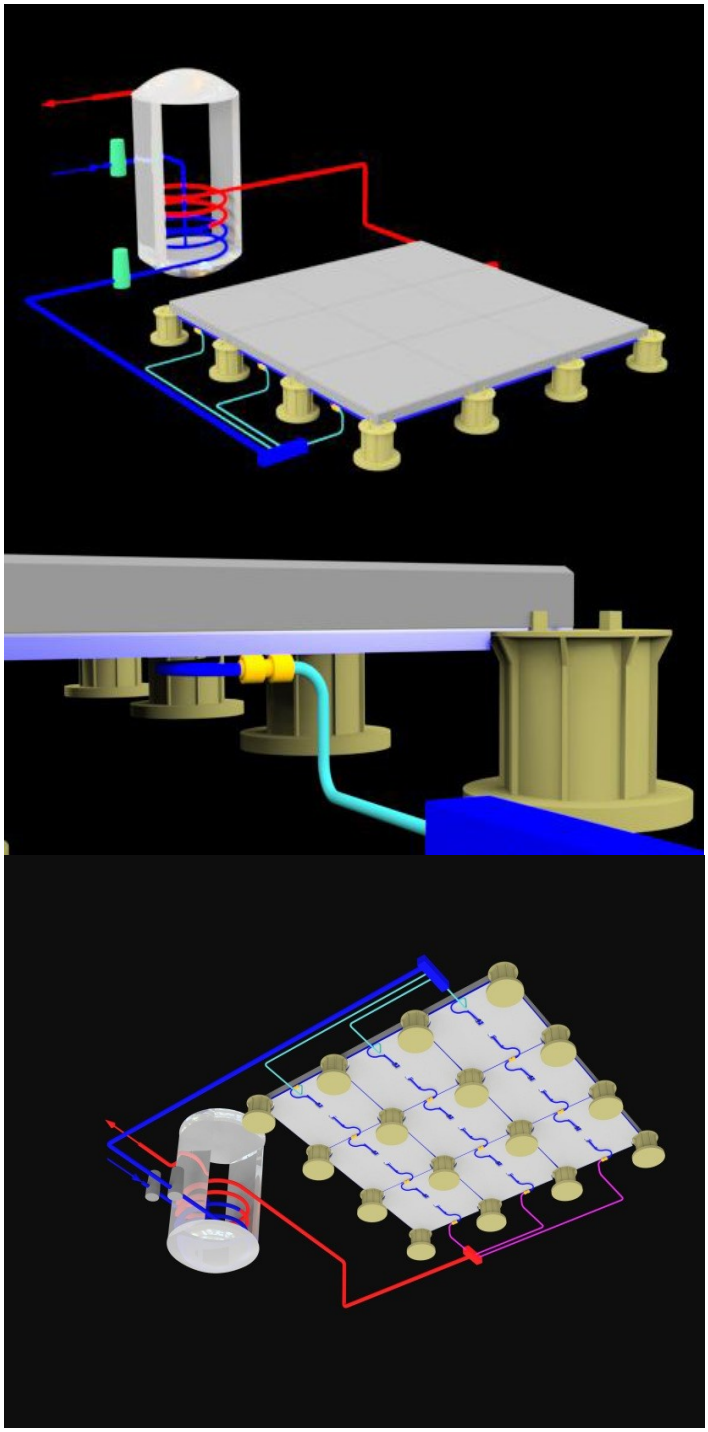
The planet will benefit from lowered CO2 emissions, lowered urban heat island effect and lowered use of limited natural resources.

Humans benefit from the use of ThermaPAVER by having comfortable outdoor spaces in winter and summer, warmer swimming pools and lower utility costs, realize possible LEED, Cool Roof and tax benefits.



ThermaPAVER pedestal version bottom view

ThermaPAVER panel from above



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