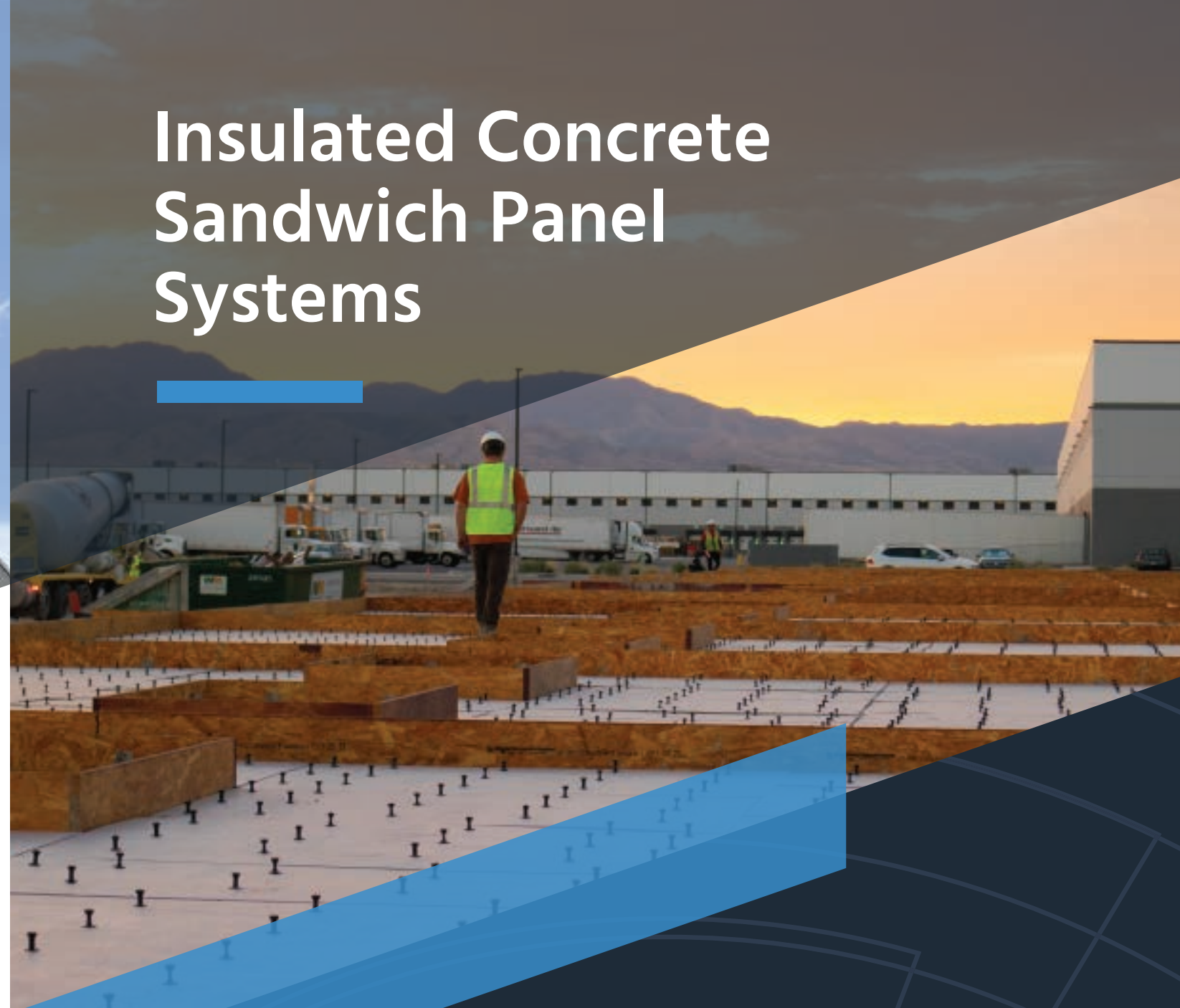






Insulated Concrete Sandwich Panel Systems



 hkties.com

 (800) 430-6316

 926 Auto Mall Drive #4
American Fork, UT 84003
USA

HKK
Composites

Industrial



Government



Warehouse



Office



Data Center



Retail



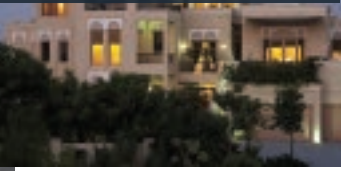
Healthcare



Correctional



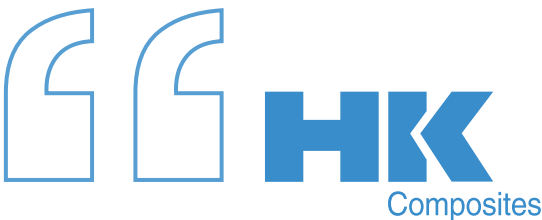
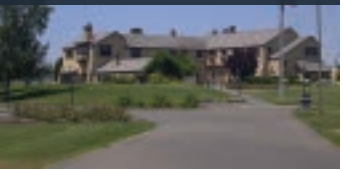
Residential



Education



Agriculture



“Although there are many different techniques in the industry to hold the sandwich panel layers together, we utilize the proven HK Composites system utilizing the fiber-reinforced connectors.”

70 Million Sq. Ft. Sandwich Panels Installed

4,000+ Projects Worldwide

29 Years Engineering Experience

Professional Associations



Our unique patented systems are designed to exceed expectations for durability, energy-efficiency and environmental responsibility.

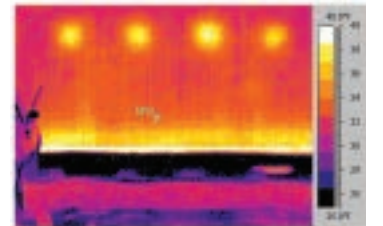
What to expect from our systems

- Holds a face wythe of concrete affixed to the panel without the need for thermally inefficient metal connectors or solid concrete sections
- High strength and low thermal conductivity
- High-performance, heat and alkaline resistant, engineered thermoplastics
- In-place temperature range: -40°F to 200°F

Thermal Bridging

Thermal bridging occurs when steel ties or solid sections are used, which can reduce energy efficiency up to 40–75%.

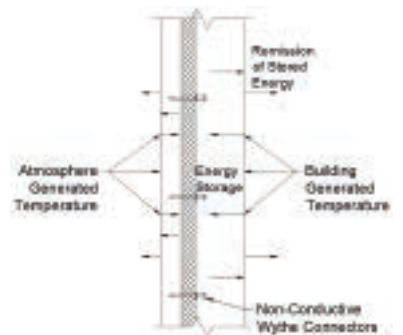
Thermal bridging is minimized by using our HK Composites low-conductivity wythe connectors. These connectors can be used in edge-to-edge insulation coverage in precast or tilt up concrete sandwich panels.



Mass Wall Effect

Mass wall effect or thermal mass is a material’s ability to absorb, store and release heat. This helps reduce daily and seasonal temperature swings.

Concrete has a high thermal mass due to high specific heat, high density and low conductivity.



R-Value Efficiency

In the USA buildings consume 65% of the electricity generated and produce 30% of the national output of greenhouse gases.

HK Composites connectors increase the R-value of concrete constructed buildings. R-value is the capacity of an insulation material to resist heat flow. The higher the R-value, the greater the insulating power. For example, 2 inches of Extruded Polystyrene (XPS) insulation has the static R-value R-10.0. Using this same 2 inches of insulation within a 12 inch insulated concrete wall panel and climate zone 5 results in an approximate R-value R16.9 (ASHRAE standard 90.1 for mass concrete walls).



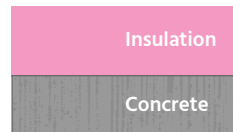
Standard System

Traditional insulated sandwich panels, comprised of a fascia wythe, insulation and a structural wythe typically fall into this system, comprised of our non-conductive wall tie and any type of desired rigid insulation.*

Designed to create a **non-composite insulated concrete sandwich panel**, allowing two wythes of concrete to be tied together via a non-conductive wall tie while permitting the two layers to shrink or expand independently of one another permitted by the tie flexibility.

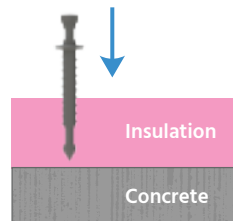
Step 1

Place rigid insulation on freshly poured concrete immediately after leveling (within 15-30 minutes.)



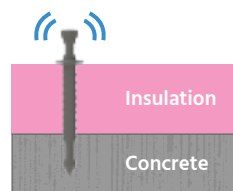
Step 2

Push the pointed end of the tie through the insulation into fresh concrete until the embedment stop is even with the top surface of the insulation.



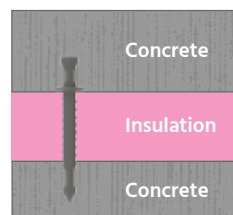
Step 3

Apply repetitive foot pressure on the insulation board near each tie, or otherwise vibrate the tie or the area around the tie.

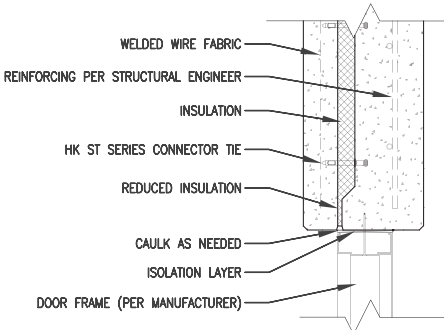


Step 4

Place specified reinforcement and cast second layer of concrete either immediately or after the bottom layer has cured.



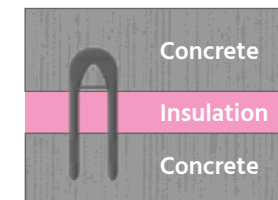
* Insulation thicknesses between 2" and 8" with ties available in 1/4-inch increments as required



Sample Detail: Reduced Insulation Door Header
Detail library access upon request

Double Prong System

The Double Prong tie is designed for 1" and 1.5" of rigid insulation. Because of the thin insulation layer the deflection is spread to two smaller prongs to accommodate the differential thermal growth between the inner and outer wythes of concrete without increasing the bending stress of the tie.



One of the loads to which concrete sandwich panel connector ties are subjected is forced displacement resulting from differential thermal growth or shrinkage of the two concrete wythes. As the insulation thickness decreases, the moment on the tie, resulting from this thermally induced forced displacement, increases exponentially, resulting in higher connector bending stresses.

In order to reduce connector bending stresses, a connector with a smaller diameter can be used. While this solves the bending stress problem, the tensile strength of the connector is reduced because of the resulting reduction in cross-sectional area. So, to maintain tensile strength while also reducing the bending stress, additional connectors can be used, hence the double-prong connector.

The combined cross-sectional area of the two prongs is slightly greater than the single-prong connector, thus maintaining the tensile strength while, because of the reduced diameter of each prong, also reducing the connector bending stress. The installation labor is not increased by needing to install twice as many connectors to achieve the same strength.

This thermally induced connector bending-stress issue is only a concern for tall wall panels, with grout under the fascia wythe, on extremely hot or cold days.

Our engineering team will help you determine which connector tie is most appropriate for each project.





CA

Composite Action System

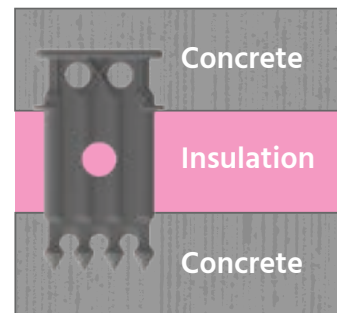
Like all of HK's products, the Composite Action System is patented and tested. This tie is designed to create a structurally-composite concrete sandwich panel.

Composite action means the two wythes of concrete are acting together structurally thus allowing a thinner panel to be created.

This allows for smaller overall panel thickness with less reinforcement. Typical panel thickness is just 4" of concrete for both the interior and exterior wythe with 2" of insulation sandwiched in between.

The tie is pushed through the pre-slotted rigid insulation (thickness of 1" to 6") until properly seated, immediately after the bottom wythe of concrete is placed.

Then, as with all of our ties, apply repetitive pressure or otherwise vibrate the tie or area around the tie to complete proper installation. Specified reinforcement is then placed and the second layer of concrete is cast.



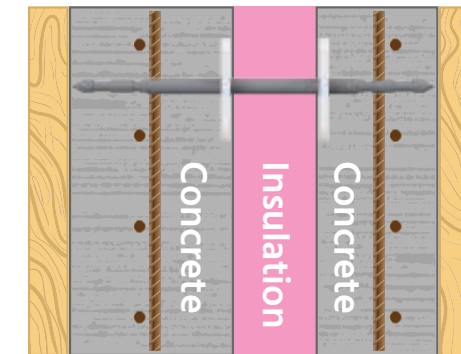
VP

Vertical Pour System

The VP System is specifically designed for use in vertical pour site-cast formwork, precast panels or modular precast units.

All VP tie sizes and dimensions can be customized depending on project design and specifications.

The HK engineering team works to make sure each project is designed and engineered to the correct specifications.



Each sheet of insulation is pre-drilled with holes or marked on one side with dots on 12 inch centers, indicating where ties would normally be inserted into the rigid insulation.





Notable Worldwide Projects



Testing and Quality Assurance



Pikes Peak Visitor Center
2022 PCI Design Award
Summit of 14,000 ft peak



Tesla Gigafactory
250,000 sq ft of wall panels
\$1 billion project



Uber Data Center
250,000 sq ft
\$100 million project



Facebook Data Center
970,000 sq ft building
\$1 billion project



Dixie Middle School
2015 TCA Achievement Award
41,000 sq ft



Clarence Correctional Centre
Australia's largest prison
\$700 million project



Fort Carson 13th CAB Barracks
486 blast resistant wall panels
226,000 sq ft



Indiana University
International studies building
36,800 sq ft



Dubai Al Barari Villas
280 residential villas
6 million sq ft

HK products and ties have been rigorously tested both in the lab and in the real world and have received approval from a variety of governing bodies.

TCA Engineering Task Group on partially composite sandwich panels

- Partially composite sandwich panels are experiencing a surge in demand due to their numerous advantages over other systems
- Unified approach to the design of sandwich panel systems

ICC-ESR 3381

- All HK products are tested in accordance of AC320
- HK ST50-ST150 ties are listed on the ICC-ESR

Intertek QA program

- HK products pass through a strict QC program to maintain eligibility of an ICC-ES report
- Intertek is a IAS certified organization

ASTM E119 Fire Testing

- HK ties have completed testing in accordance with ASTM E119
- 4 hour burn on both sides of the panel was successful
- HK is the only system to test and pass a 4 hour burn on both sides of an insulated sandwich panel

